

Habitat Suitability Index Modeling for the Oak Toad, *Bufo quercicus*, in Everglades National Park

Date of proposal: 15 September 2004

I INTRODUCTION

A. Title

Habitat Suitability Index Modeling for the Oak Toad, *Bufo quercicus*, in Everglades National Park

B. Date of Proposal

15 September 2004

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E. Abstract

The proposed study intends to further define a Habitat Suitability Index (HIS) for the oak toad (*Bufo quercicus*). This HIS model was first developed by George Dalrymple (one of the committee members for this project, and long time Everglades biologist), to correlate *B. quercicus* abundance with habitat type and hydrological condition within Everglades National Park. It is our intention to further calibrate this model in order to detect the effects of hydrology in Everglades National Park on *B. quercicus*, and how changes in the hydrology and habitat due to the large-scale Everglades restoration efforts (CERP) will affect the oak toad. With the data we collect and analyze we hope to predict how *B. quercicus* will be affected in the future as Everglades restoration efforts continue. We will then attempt to apply these results to other amphibian species which inhabit similar short-hydroperiod prairies and upland pine woods habitats. We will assess how the oak toad works as an indicator for other amphibian species affected by the CERP. Data collected for this study will contribute to an on-going modeling project administered by Dr. Don DeAngelis (another committee member), who is examining the Everglades restoration efforts on a much larger scale. The oak toad project will supply valuable information on the status of *B. quercicus* in ENP in response to Everglades restoration efforts, as well as provide Everglades National Park with a resource which can be used directly in a wildlife management context. Specifically, this project will provide a tool to assess the potential future impacts of water management decisions as the CERP continues to be implemented.

(Keywords: habitat, suitability, index, oak, toad)

II OVERVIEW

A. Statement of Issue

The need for measures that are specific to the marl prairies/rocky glades and the associated uplands was identified, during a series of workshops (March 2002) on performance measures for evaluating CERP restoration efforts and their impacts in Everglades National Park. Among currently funded CESI projects, there are no complete measures for these habitats, and most of the proposed measures would require a great deal more field data collection or are intended to be field monitoring measures (i.e., measured on an annual basis).

At the workshops, the existing Habitat Suitability Index for the oak toad, *Bufo quercicus* (Dalrymple, 1990) was identified as a possible working model that would be readily adapted for use as a performance measure for marl prairies and adapted for use in the pinelands and uplands of ENP. This model has been reviewed and accepted by both the U.S. Fish and Wildlife Service's Vero Beach office for South Florida Ecological Services and Metropolitan Dade County's Department of Environmental Resources. The model has already been applied in an analysis of habitat quality in the Bird Drive Everglades Basin Special Area Management Plan (Richter and Meyers, 1990).

Several factors make *Bufo quercicus* an ideal indicator species for short hydroperiod prairies and uplands within ENP. It is a diminutive (30 mm SVL), short-lived amphibian that can live in high densities (>500/acre) and is dependent on the presence of ephemeral wetlands for breeding (Hamilton, 1955; Dalrymple, 1990). Specifically, oak toads require the continuous presence of water for a minimum of 26 days in order for their larvae to complete metamorphosis and emerge from the wetlands. This is an inflexible hydrological limiting factor and can thus indicate the condition and consistency of the system. The facts that *B. quercicus* can live in high densities, is short-lived (approx. 2 – 3 years, Dalrymple, 1990), and is dependent on hydrological fluctuations all lead to populations of toads that rapidly respond to habitat variation in short hydroperiod wetlands (Dalrymple, 1990) and become extirpated in areas that do not retain natural vegetation and hydroperiod. Conversely, areas such as Taylor Slough, which have undergone some degree of restoration (water is pumped into it via the L31W Canal, Dalrymple, pers. comm.) may have been suitable for oak toads prior to re-hydration, and now may be too wet to be suitable for *B. quercicus*. oak toads are also considered more diurnal in their habits (a characteristic that could be verified by this project), which makes population assessment and behavioral observations much easier than for other toad species.

As stated earlier, the proposed study intends to further define and calibrate the Habitat Suitability Index (HIS) for the oak toad (*Bufo quercicus*) and to correlate *B. quercicus* abundance with habitat type and

hydrological condition within Everglades National Park. It is our intention to further develop this model in order to detect the effects of the hydrology in Everglades National Park on *B. quercicus*, and how changes in the hydrological regime and habitat due to the large-scale Everglades restoration efforts (CERP) will affect the oak toad. The data collected and analyzed will potentially be able to predict how *B. quercicus* will be effected in the future as Everglades restoration efforts continue. We will then attempt to apply these results to other amphibian species which inhabit similar short-hydroperiod prairies and upland pine woods habitats, and assess how the oak toad works as an indicator for other amphibian species affected by the CERP. Data collected for this study will contribute to an on-going modeling project administered by Dr. Don DeAngelis, who is examining the Everglades restoration efforts at a much larger scale. The oak toad project will supply information on the status of *B. quercicus* in ENP in response to Everglades restoration efforts, as well as provide Everglades National Park with a valuable resource which can be used directly in a wildlife management context. The oak toad model study can benefit the science of modeling and may possibly provide more parameters to scientists who are working with ecosystems modeling, enabling them to use more accurate descriptors.

B. Literature Summary

The literature on the life history and ecology of our study organism is sparse. A correlation between *B. quercicus* and both hydrology and vegetation density was determined by Dr. George Dalrymple's 1990 survey of oak toads in ENP. There are some basic natural history notes regarding Central Florida populations of *Bufo quercicus*, (see Hamilton, 1955), however, there may be a disparity between oak toad populations south of Lake Okeechobee and all others (Dalrymple, pers. comm.). The "Everglades Effect" (Simberlagh, 2000. Refers to an "island effect," or divergence which can occur between populations of the same species that have been historically separated for a prolonged period of time.) has been reported to have an effect on many organisms, and it is worthwhile to look into how this may affect *B. quercicus* populations in ENP.

The original Oak Toad HIS Model was generated from several field seasons of population density estimates. These data were gathered in a short hydroperiod prairie on the western end of Long Pine Key and were correlated with both vegetative cover and hydrological factors (Dalrymple, 1990). The proportion of the study area with low (<25%), moderate (25-75%), and high (>75%) herbaceous vegetative cover was estimated independently by two researchers in four adjacent 250m² areas and averaging their values. The duration of maximum continuous flooding and maximum depth of flooding were calculated from a combination of direct measurements by the researchers at each site and readings from water gauges on Long Pine Key. The following six factors (3 vegetative, 3 hydrological) were combined to generate a single HIS value for oak toads.

Table 1. Habitat Factors used in the Oak Toad H.S.I. Model		
Factor	Definition	Possible Values
BAREVEG	Proportion of Area with 0 to 25% Herbaceous Cover	0 - 1
MODVEG	Proportion of Area with 25 to 75% Herbaceous Cover	0 - 1
DENSVEG	Proportion of Area with >75% Herbaceous Cover	0 - 1
DMCFLD	Duration Maximum Continuous Flooding in Days	0 - 1
CTFLD	Cumulative Total Flooding in Days	0 - 1
MXDPTH	Maximum Depth of Flooding in cm.	0 - 1

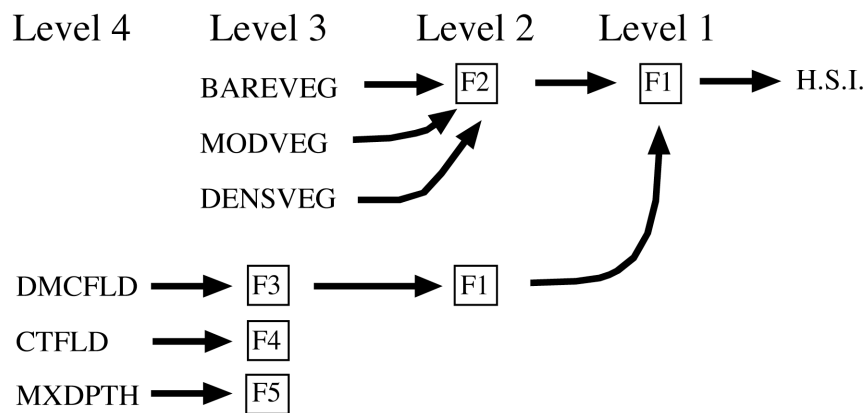


Figure X – Diagram of the Oak Toad Habitat Suitability Model (modified from Dalrymple, 1990). Habitat factors from Table 1. Function 1 (F1) = Geometric Mean. Function 2 (F2) = (BAREVEG x 0.5) + MODVEG + (DENSVEG x 0.75). Functions 3, 4 and 5 are Graph Functions (see Dalrymple 1990 pp. 51 and 52 for details)

C. Scope of Study

Although this study will be focused on the immediate vicinity of Long Pine Key, its results should be applicable to short hydroperiod marl prairies and rocky glades habitats throughout the entire Everglades ecosystem. The study will involve a minimum of three visits per week to the sites described in section IV A (Methods). We will be handling, measuring, marking and collecting data from as many oak toads as possible (hundreds or perhaps thousands), but no animals will be removed from ENP.

D. Intended Use of Results

The intended application of this project is to produce additional ATLSS SESI models (advanced forms of Habitat Suitability Index models) for use in CERP evaluations. As stated earlier, during a series of 2002 workshops focused on performance measures for evaluating CERP restoration efforts and their impacts

in Everglades National Park, the need for measures that are specific to the marl prairies/rocky glades and the associated uplands was identified. Among currently funded CESI projects, there are no complete measures for these habitats and most of the proposed measures would require a great deal more field data collection, or are intended to be field monitoring measures (i.e., measured on an annual basis). The proposed study will develop and calibrate a SESI model based on an earlier Habitat Suitability Index (HSI) for the oak toad and to correlate *B. quercicus* abundance with habitat type and hydrological condition within Everglades National Park. The data that will be collected will allow us to refine this model in order to predict the effects of changing hydrology in Everglades National Park (ENP) on short hydroperiod marl prairies and rocky glades habitat. Data collected for this study will contribute to the ongoing modeling project administered by Dr. Don DeAngelis, that examines the Everglades restoration efforts at a much larger scale. The oak toad model study will contribute to the general study of Ecosystems Modeling.

These data will be collected, analyzed, and presented in a Master's Thesis (by Mark Mandica, University of Miami), and will thereby constitute a publishable work. As mentioned earlier, the results of this study will also supplement a larger Everglades restoration model administered by Dr. Don DeAngelis (UM and USGS)

III OBJECTIVES/HYPOTHESIS TO BE TESTED

The objectives of the oak toad project are to determine if: 1) there is correlation between the abundance of *Bufo quercicus* and hydrology and/or vegetative composition [H_0 = there is no effect of hydrological and/or vegetative composition changes on oak toad abundance.] and 2) if *Bufo quercicus* would be a realistic indicator species for this model to understand how Everglades restoration efforts might influence short hydroperiod marl and rocky glades habitats.

IV METHODS

A. Description of the Study Area

We plan on approaching this study by utilizing two sampling frequencies to sample 18 study sites within Long Pine Key. These 18 sites would be comprised of 9 short hydroperiod prairies, and 9 upland pine stands. The study sites were chosen based on several criteria: 1) known habitat of *Bufo quercicus* (from Dalrymple, pers. comm.), 2) proximity to water depth gauges, and 3) road and/or foot access. Please see **figures 1 – 3** for coordinates and maps of study sites. None of these sites are designated or managed as “wilderness”.

Code	site #	name	N coord.	W coord.
TSN	1	P-Taylor Slough North	25 24.033	080 36.166
TSS	2	P-Taylor Slough South	25 24.996	080 36.189
108N	3	P-Benchmark 108 North	25.416808	-80.634393
108S	4	P-Benchmark 108 South	25.415798	-80.634635
EU1	5	U-East Fingers Upland 1	25 24.193	080 39.028
EP1	6	P-East Fingers Prairie 1	25 24.214	080 38.955
EU2	7	U-East Fingers Upland 2	25.404268	-80.646799
EU3	8	U-East Fingers Upland 3	25 24.260	080 38.737
WU1	9	U-West Fingers Upland 1	25 24.222	080 39.304
WU2	10	U-West Fingers Upland 2	25.403324	-80.659966
WP1	11	P-West Fingers Prairie 1	25 24.205	080 39.632
WP2	12	P-West Fingers Prairie 2	25.402605	-80.661201
WP3	13	P-West Fingers Prairie 3	25 24.144	080 39.724
WU3	14	U-West Fingers Upland 3	25 24.045	080 39.909
BRP	15	P-Beard road prairie	25.389527	-80.645451
BRU1	16	U-Beard road Upland 1	25.389521	-80.642826
BRU2	17	U-Beard road Upland 2	25.389652	-80.637338
BRU3	18	U-Beard road Upland 3	25.390522	-80.638608

Figure 1. Coordinates of Study Areas.

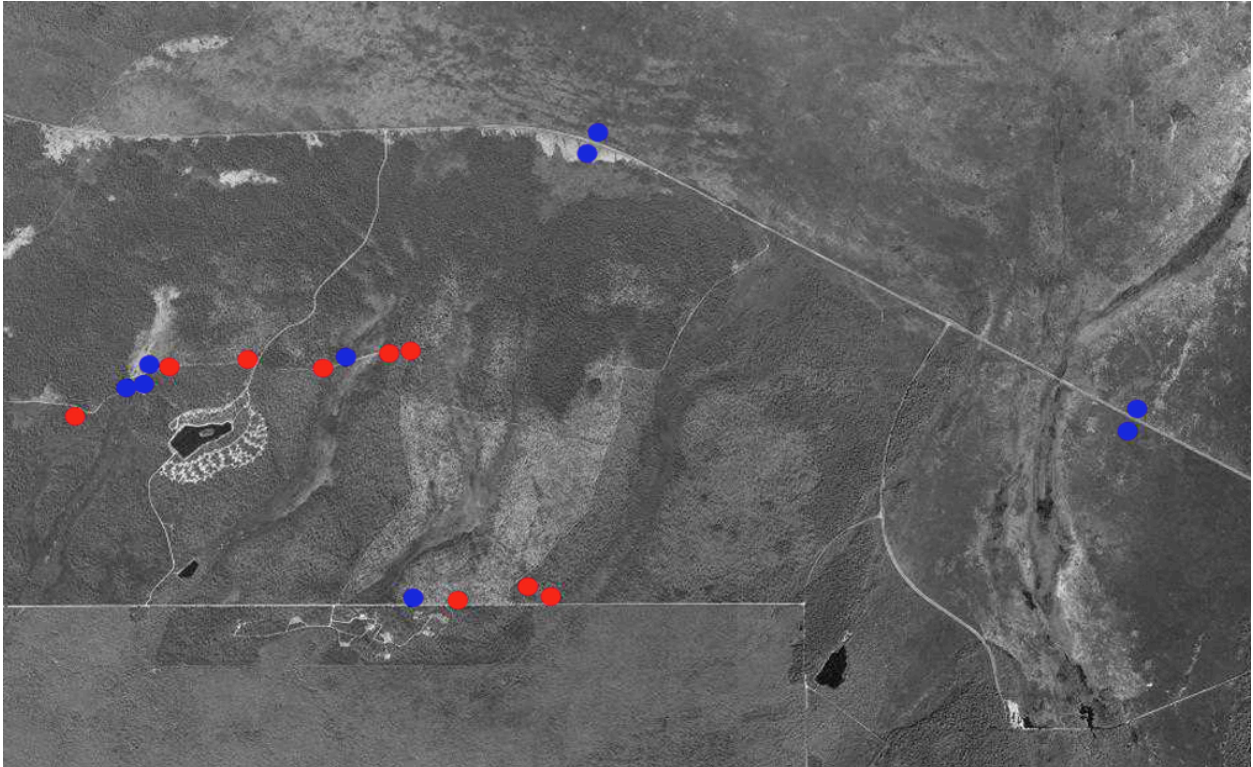


Figure 2. Aerial Photography Map of Study Areas. (red signifies upland sites, blue is short hydroperiod prairies)

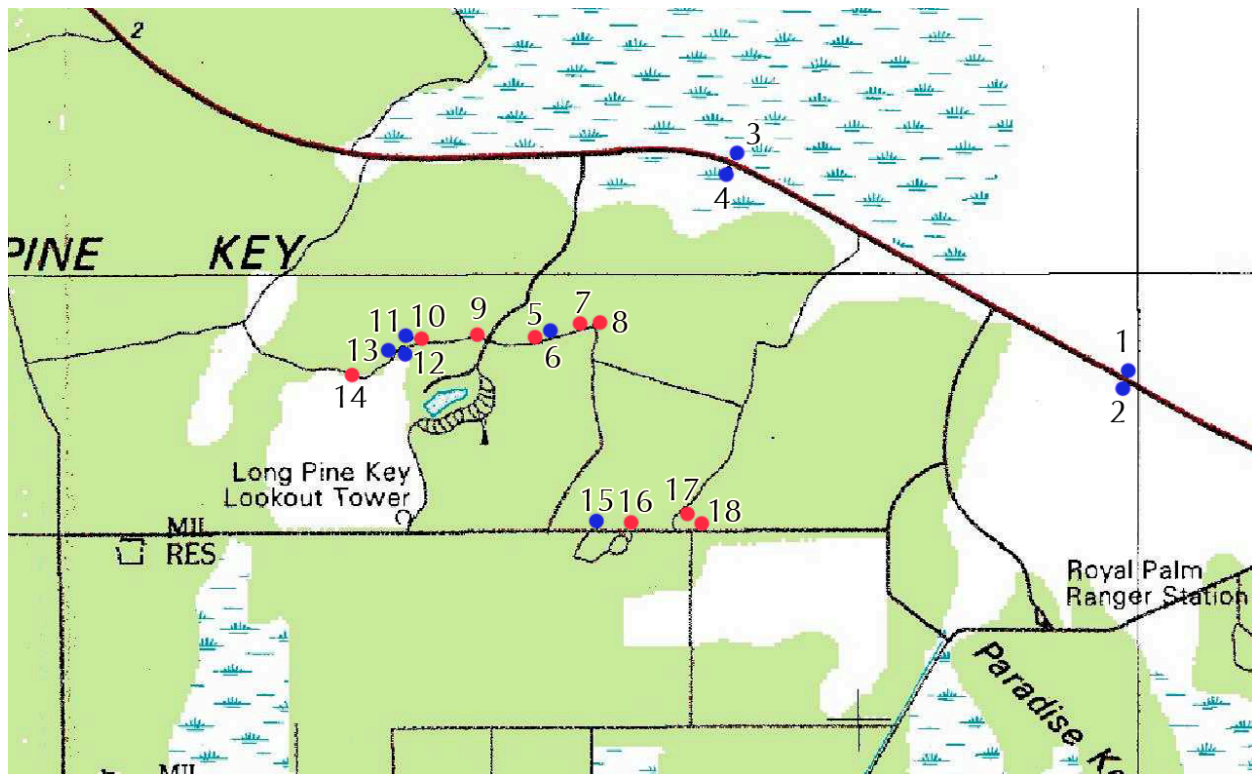


Figure 3. Map of Study Areas. (red signifies upland sites, blue is short hydroperiod prairies)

B. Procedures

Our work on the oak toad will build on earlier research performed by Dr. George Dalrymple, who, in addition, has helped in the design of the present study. Aside from the work of Dr. Dalrymple, *Bufo quercicus* has remained largely unstudied. Even basic life history traits lack thorough explanation and documentation. Previous work was done on modeling oak toads in ENP by Dr. Dalrymple, and he was able to ascertain the presence of a correlation between *B. quercicus* and hydrology, as well as between this toad and vegetation density. The original oak toad HSI model was generated from several field seasons of population density estimates. These data were gathered in a short-hydroperiod prairie on the western end of Long Pine Key and were correlated with both vegetative cover and hydrological factors (Dalrymple, 1990). The proportions of the study area with low (<25%), moderate (25-75%), and high (>75%) herbaceous vegetative cover were estimated independently by two researchers in four adjacent 250m² areas. Upon assessment of herbaceous vegetation cover, the values provided by both researchers were averaged. The duration of maximum continuous flooding and maximum depth of flooding were calculated from a combination of direct measurements by the researchers at each site and readings from water gauges on Long Pine Key. Six factors (3 vegetative, 3 hydrological) were combined to generate a single HSI value for oak toads.

Since oak toads tend to readily respond to water level fluctuations, accurate measurement of hydrological change within each site under consideration is essential for input into our prospective SESI model. The oak toad appears to be xeric in nature, thriving in regions characterized by low water levels. Although this amphibian tends to inhabit relatively dry environments, the presence of water is required for oak toad reproduction (an aquatic substrate is vital for the development of tadpoles). Groundwater levels and hydrological change through time will be quantified using identical methods as those proposed for the small mammal portion of this CESI project also conducted at ENP through the University of Miami Biology Department (under Dr. Michael Gaines). These methods are described below.

Accurate determination of the hydrological processes occurring within Everglades National Park is essential for the construction of effective SESI models. Quantification of groundwater levels in specific site locales through time is required as input for our prospective models. Once historical and present water movement processes are designated for the SESI, possible future effects of hydrological changes upon specific Everglades fauna can be ascertained. This will provide the National Park Service with invaluable information that will help guide the implementation of the CERP. Our proposed work will examine the effects of regional hydrology fluctuations upon the small mammal community, with specific focus on *O. palustris* and *S. hispidus*. Densities and movement patterns of *O. palustris* are contingent upon water quantity and availability as this small mammal routinely exhibits aquatic behavior. In order to quantify hydrology within Everglades National Park, groundwater levels will be measured at each trapping site during

every trapping period. If water gauges are present at specific sites, water levels will be gathered from these instruments. Since gauges are not present at all sites under consideration, water level will be measured using a meter stick when a gauge is unavailable. Measurements will always be taken from a standardized location within each site. Information on historical hydrologic dynamics will be acquired from contacts within the National Park Service.

We plan to utilize two sampling frequencies to study 18 study sites within ENP. These 18 sites would be comprised of 9 short hydroperiod prairies and 9 upland pine stands. The study sites were chosen based on several criteria: 1) known habitat of *B. quercicus* (from Dalrymple, pers. comm.), 2) proximity to water depth gauges, and 3) road and/or foot access. Please see figure 1 for map of study sites. The first sampling method will include a series of three exhaustive 2m² "rapid deployment" transects survey. Each series will be performed at each study area once every month [sampling frequency 1; 3 (samples) x 12 (months) x 18 (sites) = 600 samples/year]. A 2m² plot will be staked off using rebar with a fence fastened to it. The fence will remain off the ground until the following day when it is dropped; thereafter, everything inside the fence will be sampled and recorded. Also, as part of the initial day of set-up, sticky traps and fire caches will be placed at each sampling site so that the following day ant/food densities can be recorded and ground moisture can be indexed (from the sticky traps and the fire caches respectively). The second sampling method will entail a more frequent, less exhaustive visual transect survey. Each site will be sampled using this method every two weeks [sampling frequency 2; 24 (bi-weeks) x 18 (sites) = 400 samples/year]. A 20m² transect will be walked according to a standard pattern. Cover-boards (2 per site) will be placed at the interior of each transect line and checked when the site is sampled. An inventory of the vegetation composition will occur at the beginning of each sampling period.

We would like to determine if Everglades oak toads have similar home ranges compared to the Central Florida populations reported in Hamilton, 1955, by performing mark/recapture studies at 3 of the 18 study sites. In order to perform this study, we would need to mark individual toads in a unique way for future identification. We propose to use toe clipping and acrylic elastomer injection (Woolley 1973) to give each toad captured a unique identifying mark. While the use of two marking techniques may seem redundant, we would like the opportunity to test which of these techniques works best with oak toads. Once the best method is determined, we will proceed using only the most efficient technique.

Preparations have already begun in anticipation of and conditional upon this permit application's approval. We expect field data collection to begin immediately after the permit's acceptance. This work will continue through the current field season (ending early December 2004) and resume in February 2005. Depending on our budget, it will continue through that field season as well (ending December 2005) and will recommence in February 2006. It is possible that data collection will continue year-round, with oak toad activity examined through the dry season. While the larger Everglades Restoration Model is an on-going

project, the Master's Thesis of graduate student Mark Mandica, who is implementing the study, will be completed in May 2005 or May 2006 depending on the amount of time needed for the conclusion of this research. Please see figures 2a and 2b for illustrations of our sampling techniques.

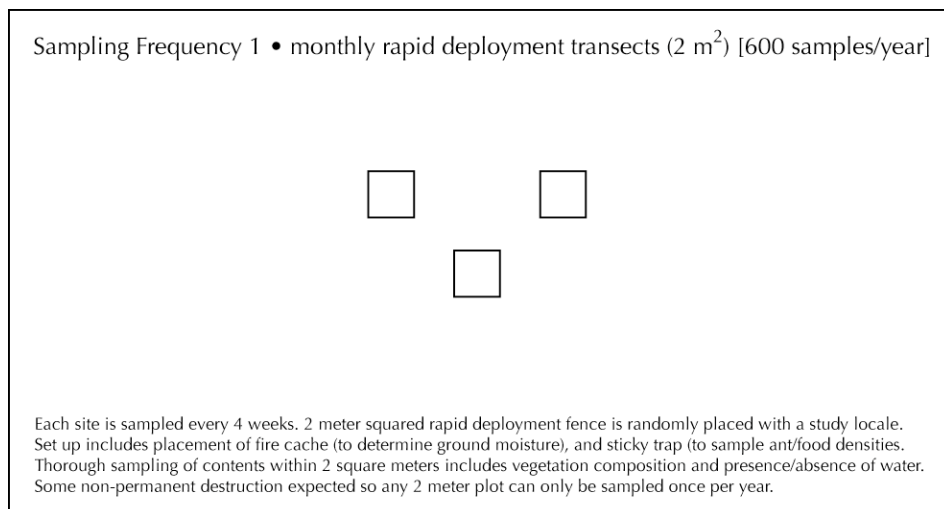


Figure 2a. Sampling method 1 to be employed during our study.

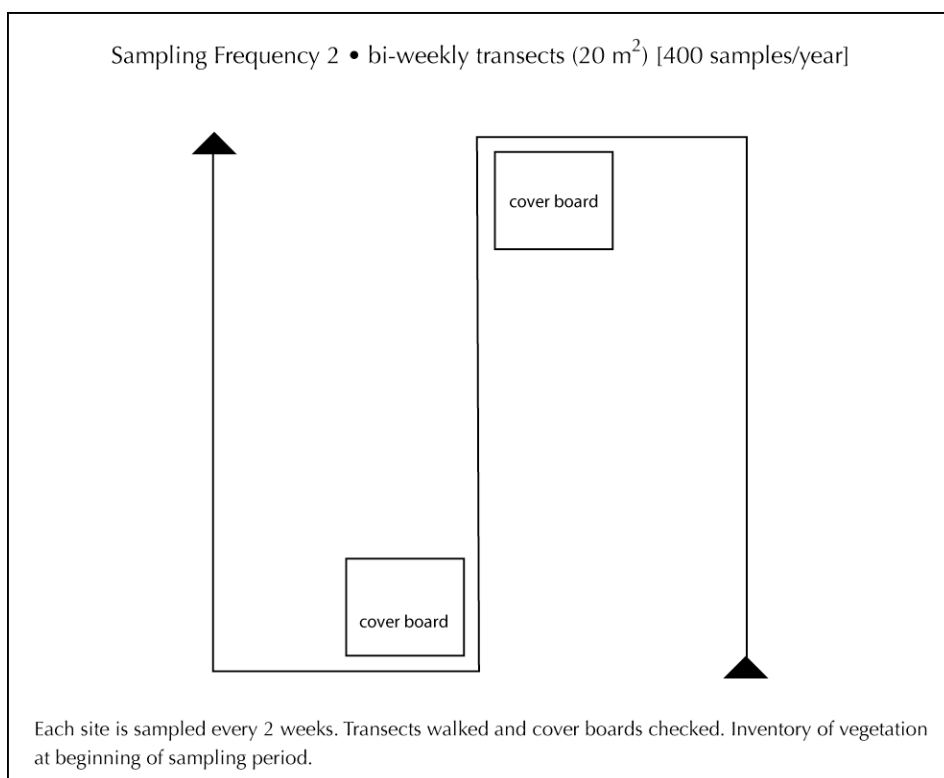


Figure 2b. Sampling method 2 to be employed during our study.

C. Collections

No animals will need to be collected for the purposes of this study. We would, however, like to collect tissue samples (toe clips on adult toads, tail clips on larvae) for the purpose of aging animals, and allowing for potential future genetic population studies. As stated in the previous section, we would also like to conduct home range experiments at 1 to 3 sites which would entail marking adult toads with either a cohort mark toe clip (all individuals from a location would get an identical toe clip) or use an acrylic elastomer (Woolley 1973) to give each animal a unique "tattoo" which could subsequently identify individual toads in the event of recapture.

D. Analysis

As mentioned previously, all data collected will be used to supplement Dr. Don DeAngelis' larger Everglades Restoration Model. The data analysis will culminate in the development of a Spatially Explicit Species Index (SESI) also known as a Habitat Suitability Index (HIS). This model will be able to address the needs of the Comprehensive Everglades Restoration Plan (CERP) to project the effects of hydrology on a key component of the Everglades biota.

E. Schedule

Preparations have already begun in anticipation of and conditional upon this permit application's approval. We expect field data collection to begin immediately after the permit's acceptance. This field work will continue through this current field season (ending early December 2004) and resuming in February 2005. Depending on our budget, it will continue through that field season as well (ending December 2005) and resuming again in March 2006. It is possible that data collection will continue year round, and examine Oak Toad activity through the dry season. However, the majority of the data analysis and writing will occur through the dry season. While the larger Everglades Restoration Model is an on-going project, the Master's Thesis of the graduate student, Mark Mandica, who is implementing the study, will be completed in May 2005 or May 2006 depending on the amount of time needed to complete the study.

F. Budget

Mark Mandica, the graduate student working on this study, has been granted an RA at the University of Miami by USGS and NPS, for the sole purpose of designing and implementing the Oak Toad Project. To this end, he has been awarded \$18,000 per 9 months (September – May) for 2 years, with the possibility of a third field season. Any reasonable costs for supplies needed to implement the study will also be covered by the research grant (#BAA/RFP Q528404CESI).

V PRODUCTS

A. Publications and Reports

These data will be collected, analyzed, and presented in a Master's Thesis (by Mark Mandica, University of Miami), and will thereby constitute a publishable work. As mentioned earlier, the results of this study will also supplement a larger Everglades restoration model administered by Dr. Don DeAngelis (UM and USGS). It is possible, that there will be further publishable information to augment the basic life history information currently available for *Bufo quercicus*.

B. Collections

All tissue samples potentially collected during the course of this study will be used for analysis, and it is unlikely that any materials would remain. If remaining materials exist, they will be donated to the Herpetological Collection Repository of ENP.

VI LITERATURE CITED

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VII QUALIFICATIONS

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1998 Darwin Postdoctoral Fellowship - Organismic and Evolutionary Biology Program, University of Massachusetts Amherst.
1997 Alternate - Miller Postdoctoral Fellowship - University of California, Berkeley
1997 Travel Grant (\$1,000.00) from Associate Provost for Research and Graduate Studies, Northern Arizona University.
1997 Honorable Mention - Stoye Award for best student presentation in ecology and ethology - American Society of Ichthyologists and Herpetologists, Seattle WA
1995 Scholander Award for best student presentation - American Physiological Society, Atlanta GA
1990 Grant-in-Aid-of-Research, Sigma Xi (\$500.00)
1987 NSF REU Fellowship, University of Michigan

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2002- Associate Researcher, Universidade Católica de Goiás, Brasil
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1998-0 Postdoctoral Fellow, University of Massachusetts.
1998 Faculty Associate, Northern Arizona University.
1989-97 Research Assistant, Northern Arizona University.
1989-96 Teaching Assistant, Northern Arizona University.

Publications

1) Meyers, J.J., O'Reilly, J.C., J. A. Monroy and K. C. Nishikawa. 2004. Mechanism of tongue protraction in microhylid frogs. *Journal of Experimental Biology* 207: 21-31.

- 2) O'Reilly, J.C., K.C. Nishikawa and S.M. Deban. 2002. Derived Life History Characteristics Constrain the Evolution of Aquatic Feeding Behavior in Adult Amphibians. Pp. 153-190 In: Topics in Functional and Ecological Vertebrate Morphology. P. Aerts, K. D'Août, A. Herrel and R. Van Damme (eds.) Maastricht: Shaker Publishing.
- 3) Herrel, A., J.C. O'Reilly and A. R. Richmond. 2002. Evolution of Bite Performance in Turtles. *Journal of Evolutionary Biology* 15: 1083-1094.
- 4) Deban, S.M., J.C. O'Reilly, and K.C. Nishikawa. 2001. The evolution of the motor control of feeding in amphibians. *American Zoologist* 41: 1280-1298.
- 5) O'Reilly, J.C., A.P. Summers and D.A. Ritter. 2000. The evolution of the function of the trunk muscles during locomotion in adult amphibians. *American Zoologist* 40: 123-135.
- 6) O'Reilly, J.C. 2000. Feeding in Caecilians. pp. 149-166. In: *Evolution of Feeding in Tetrapods* (K. Schwenk ed.). Academic Press.
- 7) Summers, A.P. and J.C. O'Reilly. 1997. A comparative study of locomotion in the caecilians *Dermophis mexicanus* and *Typhlonectes natans* (Amphibia: Gymnophiona). *The Zoological Journal of the Linnean Society* **121**: 65-76.
- 8) Gray, L.A., J.C. O'Reilly and K.C. Nishikawa. 1997. The evolution of forelimb movement patterns for prey-capture and prey-transport in anurans. *The Journal of Experimental Zoology* **277**: 417-424.
- 9) O'Reilly, J.C., D.A. Ritter and D.R. Carrier. 1997. Hydrostatic locomotion in a limbless tetrapod. *Nature* **386**: 269-272.
- 10) O'Reilly, J.C., R.A. Nussbaum and D. Boone. 1996. Vertebrate with protrusible eyes. *Nature* **382**:33.
- 11) O'Reilly, J.C. 1996. Keeping Caecilians in Captivity, pp. 39-46. In *Advances in Herpetoculture* (P. Strimble ed.). Special Publications of the International Herpetological Symposium, Vol. 1.
- 12) O'Reilly, J.C. and D.A. Ritter. 1995. Observations on the birth of a caecilian (Amphibia: Gymnophiona). *Herpetological Natural History* **3**: 199-202.
- 13) Deban, S.M., J.C. O'Reilly and T. Theimer. 1994. The mechanism of defensive inflation in the chuckwalla, *Sauromalus obesus*. *Journal of Experimental Zoology* **270**: 451-459.
- 14) Nishikawa, K.C., C.W. Anderson, S.M. Deban and J.C. O'Reilly. 1992. The evolution of neural circuits controlling feeding behavior in frogs. *Brain, Behavior and Evolution* **40**: 125-140.
- 15) Eisner, T., J. Conner, J. Carrel, J.P. McCormick, A.J. Slagle, C. Gans and J.C. O'Reilly. 1990. Systemic retention of ingested cantharidin by frogs. *Chemoecology* **1**: 57-62.

Submitted Manuscripts

- 1) Deban, S. M. and J.C. O'Reilly. The ontogeny of feeding kinematics in the Hellbender (*Cryptobranchus alleganiensis*) For *Journal of Experimental Biology*. Accepted Pending Revision.

Manuscripts in Preparation

- 1) O'Reilly, J.C., K.C. Nishikawa and S.L. Lindstedt. The ontogeny of feeding kinematics in the Sonoran Desert toad (*Bufo alvarius*). For *Journal of Experimental Biology*
- 2) O'Reilly, J.C. The evolution of prey capture kinematics in caecilians (Amphibia: Gymnophiona). For *The Journal of Experimental Zoology*.
- 3) Choquette, D. M., J.C. O'Reilly and E. L. Brainerd. The ontogeny of buccal oscillation behavior in the Sonoran Desert Toad. For *Journal of Experimental Biology*.

Published Abstracts

- 1) Deban, S. M., J.C. O'Reilly, U. Dicke and J. Van Leeuwen. Extremely high-power tongue projection in plethodontid salamanders. *Journal of Integrative and Comparative Biology*
- 2) O'Reilly, J.C., A. Herrel, S.M. Deban, J.J. Meyers, K.C. Nishikawa and S.L. Lindstedt. 2002. Ontogenetic Scaling of Speed and Force in the Feeding Systems of Ectothermic Vertebrates. *The FASEB Journal*. 16: A47
- 3) Herrel, A., O'Reilly, J.C. and Richmond A.M. 2001 Ontogenetic and evolutionary scaling of bite force in turtles. *American Zoologist* 41: 1470.
- 4) Nishikawa, K.C. and J.C. O'Reilly. 2001. Scaling of activity of the jaw and tongue muscles during feeding in toads. *Journal of Morphology*
- 5) McGowan, C.P., O'Reilly, J.C. and Nishikawa, K.C. 2001. Scaling of the Feeding Mechanism in the Colorado River Toad. *American Zoologist*.
- 6) O'Reilly, J.C., N. J. Kley, A. R. Richmond and E. L. Brainerd. 2000. Prey Capture in *Chelus fimbriatus* (Testudines: Pleurodira). *American Zoologist*.
- 7) Deban, S. M., J. C. O'Reilly and K. C.. Nishikawa. 2000. The evolution of the motor control of feeding in amphibians. *American Zoologist*.
- 8) Choquette, D.M., J.C. O'Reilly and E.L. Brainerd 1999. Buccal oscillation behavior and body size in the Sonoran Desert toad (*Bufo alvarius*). *American Zoologist* 39: 81A.
- 9) Reiss, J.O. and J.C. O'Reilly 1999. Skull development in the west African caecilian *Geotrypetes seraphini*(Gymnophiona:Caeciliidae) *American Zoologist* 39: 82A.
- 10) McGowan, C.P, J.C.O'Reilly, J. Birch and K.C.Nishikawa 1999. Scaling in the skull of the Colorado River toad, *Bufo alvarius*. *American Zoologist* 39: 96A.
- 11) O'Reilly, J.C., D. Fenolio, L.C. Rania and M. Wilkinson. 1998. Altriciality and extended parental care in the west African caecilian *Geotrypetes seraphini* (Gymnophiona: Caeciliidae). *American Zoologist* 38: 187A.
- 12) Nishikawa, K.C., J.C. O'Reilly and S.E. Peters. 1997. Scaling of activation patterns and contractile properties in the jaw and tongue muscles of toads. *American Zoologist* 37: 136A.
- 13) Deban, S.M. and J.C. O'Reilly. 1997. Scaling of the kinematics and motor control of prey capture in salamanders and toads. *Journal of Morphology* 232: 246.

- 14) Meyers, J.J., K.C. Nishikawa and J.C. O'Reilly. 1996. Tongue aiming in the microhylid frog *Phrynomerus bifasciatus*. *American Zoologist* 36: 81A.
- 15) Deban, S.M. and J.C. O'Reilly. 1996. Kinematic isometry and allometry in the feeding movements in the hellbender, *Cryptobranchus alleganiensis*. *American Zoologist* 36: 84A.
- 16) Tso, T.A., J.C. O'Reilly and K.C. Nishikawa. 1995. Conservation of function of the m. hyoglossus during feeding in frogs. *American Zoologist* 35:123A.
- 17) O'Reilly, J.C., D.A. Ritter, A.P. Summers and D.R. Carrier. 1995. The mechanism of concertina locomotion and burrowing in the caecilian *Dermophis mexicanus* (Amphibia: Gymnophiona). *American Zoologist* 35:147A.
- 18) Nishikawa, K.C., J.C. O'Reilly, B.A. Richards and P.C. Wainwright. 1995. Scaling of jaw muscle activity with body size in ectothermic vertebrates. *Society for Neuroscience Abstracts* 21:687.
- 19) Mallet, E. S., G. T. Yamaguchi, K. Nishikawa and J. O'Reilly. 1995. A biomechanical model for the simulation of the frog tongue flip mechanism. *American Society of Biomechanics*.
- 20) O'Reilly, J.C., S.L. Lindstedt and K.C. Nishikawa. 1995. Speed of movement in geometrically similar animals: A test of a prediction made by A.V. Hill. *FASEB Journal* 9:A79.
- 21) O'Reilly, J.C., S.L. Lindstedt and K.C. Nishikawa. 1994. The relationship of size and speed of movement in an isometrically scaling vertebrate musculoskeletal system. *Journal of Morphology* 220:378.
- 22) Nishikawa, K.C., J.C. O'Reilly, B.W.P. Sasongko and C.W. Anderson. 1994. Convergent evolution of hypoglossal afferents that influence jaw muscle activity in frogs. *Journal of the Arizona-Nevada Academy of Sciences* 29:15.
- 23) O'Reilly, J.C., S.L. Lindstedt and K.C. Nishikawa. 1993. The scaling of feeding kinematics in toads (Anura: Bufonidae). *American Zoologist* 33:147A.
- 24) Nishikawa, K.C. J.C. O'Reilly, B.W.P. Sasongko and C.W. Anderson. 1993. Convergent evolution of hypoglossal afferents that influence jaw muscle activity in frogs. *Society for Neuroscience Abstracts* 19:161.
- 25) O'Reilly, J., S. Lindstedt and K. Nishikawa. 1993. The relationship of body size and feeding behavior in toads. *Arizona Nevada Academy of Sciences* 28:13-14.
- 26) Cannatella, D.C., K. Nishikawa and J. O'Reilly. 1992. Patterns of convergence in tongue projection in frogs. *American Zoologist* 32:134A.
- 27) O'Reilly, J. and S. Deban. 1991. The evolution of aquatic prey capture in amphibians: phylogenetic constraints and exaptations. *American Zoologist* 31:17A.
- 28) Nishikawa, K., J.C. O'Reilly and D.C. Cannatella. 1991. Biomechanical and behavioral transitions in the evolution of frog feeding. *American Zoologist* 31:52A.
- 29) O'Reilly, J. 1990. Aquatic and terrestrial feeding in caecilians: a possible example of phylogenetic constraint. *American Zoologist* 30:140A.

Invited Seminars

2003	Calusa Herp Society, Ft. Myers Florida
2003	Department of Organismal Biology and Anatomy, University of Chicago
2002	Catholic University of Goiás
2002	Department of Biological Sciences, Florida Atlantic University
2002	Department of Biology, University of South Florida
2002	Department of Zoology, University of Brasília
2002	Department of Ecology and Evolutionary Biology, Tulane University
2002	Department of Ecology and Evolution, University of California Irvine
2000	Concord Field Station, Harvard University
2000	Department of Ecology and Evolutionary Biology, Princeton University
2000	Neuroscience and Behavior Program, University of Massachusetts
2000	Department Biology, University of Miami
2000	Department Ecology and Evolutionary Biology, Yale University
1998	Department of Physiology, University of São Paulo, Brazil
1998	Organismic and Evolutionary Biology Program, University of Massachusetts
1998	Section of Evolution and Ecology, University of California, Davis
1998	Department of Biological Sciences, University of Nevada, Las Vegas
1997	Division of Biological Sciences, Cornell University
1996	Arizona Department of Game and Fish, Phoenix
1996	Museum of Vertebrate Zoology, University of California, Berkeley
1996	Department of Biology, University of Utah, Salt Lake City
1996	Museum of Vertebrate Zoology, University of California, Berkeley
1995	Concord Field Station, Harvard University
1993	Museum of Vertebrate Zoology, University of California, Berkeley

Invited Symposium Presentations

2002	O'Reilly, J.C., K.C. Nishikawa and S.M. Deban. Derived Life History Characteristics Constrain the Evolution of Aquatic Feeding Behavior in Adult Amphibians. Symposium in Honor of Dr. Frits de Vree, University of Antwerp.
2001	O'Reilly, J.C., N.J. Kley, D.A. Ritter, A.P. Summers and D.R. Carrier. Kinetics of Burrowing in Limbless Tetrapods: What Can Convergence Reveal About the Emergence of Novel Functional Systems? International Congress of Vertebrate Morphology - Jena, Germany
2000	Deban, S.M., O'Reilly, J.C. and Nishikawa, K.C. The evolution of the motor control of feeding in amphibians. Society for Integrative and Comparative Biol.. Chicago, IL.
1999	O'Reilly, J.C., D.A. Ritter and A.P. Summers. The evolution of the function of the trunk muscles during locomotion in amphibians. Society for Integrative and Comparative Biology. Denver, CO.
1997	O'Reilly, J.C., N.J. Kley, D.A. Ritter and A.P. Summers. A comparison of the mechanism of concertina locomotion and burrowing performance in caecilians and snakes. Fifth International Congress of Vertebrate Morphology. Bristol, U.K.
1995	O'Reilly, J.C. Ontogenetic constraints on the feeding behavior of secondarily aquatic adult amphibians. Society for Study of Amphibians and Reptiles. Boone, NC.

Contributed Papers

- 1) Levine, R., W.O. Bennett III and J. C. O'Reilly. 2000. Regional Functional Specialization and Integration in the Interhyoideus Muscle of *Dermophis mexicanus*. Northeast Regional Meeting of the SICB Division of Vertebrate Morphology.
- 2) O'Reilly, J.C., S.M. Deban, N.J. Kley and A.M. Richmond. 1999. Are turtles and frogs capable of suction feeding? Joint Meeting of American Society of Ichthyologists and Herpetologists, Society for the Study of Reptiles and Amphibians and The Herpetologists League.
- 3) O'Reilly, J.C. 1997. The evolution of aquatic feeding behavior in anurans. Joint Meeting of American Society of Ichthyologists and Herpetologists, Society for the Study of Reptiles and Amphibians and The Herpetologists League.
- 4) Meyers, J.J., J.C. O'Reilly, and K.C. Nishikawa. 1997. The evolution of tongue aiming in microhylid frogs. Joint Meeting of American Society of Ichthyologists and Herpetologists, Society for the Study of Reptiles and Amphibians and The Herpetologists' League.
- 5) O'Reilly J.C. and D.A. Ritter. 1996. Comparative burrowing performance in caecilians and boid snakes. American Society of Ichthyologists and Herpetologists.
- 6) Nishikawa, K.C., C.W. Anderson and J.C. O'Reilly. 1996. Evolution of sensory pathways that modulate the feeding behavior in frogs. Regional Meeting, Arizona Society for Neuroscience.
- 7) Nishikawa, K.C., C.W. Anderson and J.C. O'Reilly. 1995. The evolution of sensory pathways that modulate the feeding behavior in frogs. Symposium on Neurons, Networks and Motor Behavior Tucson AZ.
- 8) Gray, L.A., J.C. O'Reilly, and K.C. Nishikawa. 1995. The evolution of patterns of forelimb use for feeding in anurans. Society for the Study of Amphibians and Reptiles.
- 9) Summers, A.P and J.C. O'Reilly. 1995. Caecilians and concertina: not the people or the instrument. Eastern Regional Meeting of the Division of Vertebrate Morphology of the American Society of Zoologists.
- 10) O'Reilly J.C. and A.P. Summers. 1995. Comparative kinematic analysis of vertebral-skin translation during lateral undulation and concertina locomotion in two caecilians. American Society of Ichthyologists and Herpetologists.
- 11) Carlson, M.D. and J.C. O'Reilly. 1994. Prey capture kinematics in the amphibious caecilian *Hypogeophis rostratus* and its bearing on the evolution of feeding behavior in the aquatic *Typhlonectes natans*. Amer. Society of Ichthyologists and Herpetologists.
- 12) O'Reilly, J.C. 1994. Feeding kinematics in *Scolecophorus* (Gymnophiona: Scolecophoridae): a test of the functional significance of temporal fenestrae in caecilians. American Society of Ichthyologists and Herpetologists.
- 13) O'Reilly, J.C. 1993. The relationship of body size and feeding kinematics in toads (*Bufo alvarius*). Eastern Regional Meeting of the Division of Vertebrate Morphology of the American Society of Zoologists.
- 14) Nishikawa, K.C., D.C. Cannatella and J.C. O'Reilly. 1993. Functional morphology of tongue protraction in frogs. Symposium on Functional Morphology. Second World Congress of Herpetology, Adelaide, Australia.
- 15) Cannatella, D.C., K. Nishikawa, and J. O'Reilly. 1993. Phylogenetic analysis of character correlations in tongue projection and tongue shape in anurans. Symposium on Biology of Feeding in Fishes, Amphibians and Reptiles. American Society of Ichthyologists and Herpetologists, Austin, TX.

- 16) O'Reilly, J.C., S.L. Lindstedt and K.C. Nishikawa. 1992. The effects of body size on the performance of tongue flipping in toads. Arizona Exercise Science Symposium.
- 17) Cannatella, D.C., K. Nishikawa and J. O'Reilly. 1991. Phylogenetics, kinematics, and the evolution of tongue projection systems in frogs. Society for the Study of Evolution - American Society of Naturalists.
- 18) Nishikawa, K., J.C. O'Reilly and D.C. Cannatella. 1991. Biomechanical and behavioral transitions in the evolution of frog feeding. Society for the Study of Evolution - American Society of Naturalists.
- 19) Cannatella, D.C., K. Nishikawa and J. O'Reilly. 1991. Phylogenetics of lingual projection systems in frogs. Society for the Study of Amphibians and Reptiles- Herpetologists' League.
- 20) O'Reilly, J.C. 1988. Prey capture in caecilians: a comparison between aquatic and terrestrial species and its relevance to the phylogeny of the Gymnophiona. American Society of Ichthyologists and Herpetologists - Society for the Study of Amphibians and Reptiles - Herpetologists League.

Professional Service

Editor - *Tentaculata* (Newsletter for Caecilian Researchers)

Reviewer - *Journal of Experimental Biology*

Reviewer – *Nature*

Reviewer – *Zoology*

Reviewer – *Systematic Biology*

Reviewer – *Herpetologica*

Reviewer – *Evolution*

Reviewer - *Herpetological Review*

Reviewer – *American Zoologist*

Reviewer - *Herpetological Monographs*

Reviewer - *Copeia*

Reviewer - National Science Foundation

Reviewer - Natural Environment Research Council (U.K.)

Professional Affiliations

The Society for Integrative and Comparative Biology

The American Physiological Society

The International Congress of Vertebrate Morphology

The American Society of Ichthyologists and Herpetologists

The New York Academy of Sciences

Teaching Experience

Spring 2004 Comparative Vertebrate Anatomy

Fall 2003 General Physiology

Spring 2003 Physiological Ecology

Fall 2002 General Physiology

Fall 2001 General Physiology

Fall 2000 Comparative Vertebrate Anatomy
Fall 1999 Comparative Vertebrate Anatomy
Spring 1999 Comparative Vertebrate Anatomy
Spring 1998 Herpetology (Lecture and Laboratory)

Mark Mandica

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PRESENT POSITIONS

President, Mandica Illustration & Design, Inc. Scientific and technical rendering for research articles and reviews. Illustration and Graphic Design

Graduate Student, O'Reilly Vertebrate Functional Morphology and Comparative Physiology
Laboratory, Biology Department, University of Miami

Collections Council, Miami Museum of Science, Miami, FL

EDUCATION

Bachelor of Science (B.S.) in Biology, with a concentration in Evolutionary Biology. Bachelor of Arts (B.A.) in Sociology. Minor in Psychology (Graduated May 1999) University of Massachusetts, Amherst.

EXPERIENCE**TEACHING EXPERIENCE**

1996 - present Evolution, Biology, and Awareness of Reptiles and Amphibians, elementary through college level lectures, University of Massachusetts (Amherst, MA), Amherst Middle School (Amherst, MA), Smith Campus School (Northampton, MA), Dean Technical School (Holyoke, MA), Granite House (Quincy, MA) University of Connecticut (Storrs, CT), Hitchcock Center (Amherst, MA)

1998 Undergraduate Teaching Assistant, Bio 540, Herpetology, University of Massachusetts

CURATORIAL EXPERIENCE

2004- Collections Council, Miami Museum of Science, Miami, FL

2003 Curatorial Assistant, Department of Mammalogy, Division of Vertebrate Zoology,
American Museum of Natural History (New York, NY)

1996 – 02 Museum Assistant, Herpetological and Ichthyological Collections, Massachusetts
Museum of Natural History, Bio. Department, University of Massachusetts (Amherst,
MA)

1999 Collection and preparation of specimens for the Ichthyological Collection of the
Massachusetts Museum of Natural History, Dauphin Island Sea Lab (Dauphin Island, AL)

RESEARCH EXPERIENCE

1999 – 02 Amphibian population study of vernal ponds in the Quabbin Watershed Management
Area. Daily surveys, data collection and analysis. Reports submitted to the Metropolitan
District Commission (Spring 2000, Fall 2001)

2001 Field Biologist, supervised research team on a metapopulation study of the Marbled
Salamander (*Ambystoma opacum*). Natural Resources Conservation, University of
Massachusetts (Amherst, MA)

2001 Spotted turtle (*Clemmys guttata*) survey of Lily Pond (Vernon, VT)
Report submitted to Vermont Fish and Wildlife Department (Waterbury, VT)

Herpetological survey of Satan's Kingdom Wildlife Management Area (Northfield, MA)
Report submitted to Massachusetts Natural Heritage Program (Westboro, MA)

Research techniques include: audio/visual diurnal and nocturnal surveys, terrestrial and aquatic transects, drift
fencing with funnel and pitfall trap arrays, dipnet, trapping, and radio telemetry. Analytical and statistical
analysis

OTHER PERTINENT EXPERIENCE

1996 - 2002 Primary care provider of the living herpetological teaching collection, Massachusetts Museum of Natural History, Biology Department, University of Massachusetts
A strong familiarity with the amphibian and reptile species native to New England

PUBLICATIONS

ARTICLES

Scaphiopus holbrookii (Eastern Spadefoot) Geographic Distribution. Herpetological Review. 31(2):110 (2000)

PUBLISHED ILLUSTRATIONS

D.B. Fenolio, M.E. Walvoord, F. Andreone, J.F. Stout, J.E. Randrianirina. 2004. A new *Platypelis* (Amphibia: Anura: Microhylidae) frog living in treeholes of low-altitude rainforests of the Masoala Peninsula, NE Madagascar. Proceedings of the Biological Society of Washington.
Meyers, J.J., O'Reilly, J.C., Monroy, J.M., and K.C. Nishikawa 2004. Mechanism of tongue protrusion in Microhylid frogs. J. Exp. Biol 207, 21-31, figs. 1 and 3.
Landberg, T., J. Mailhot, and E. Brainerd. Lung ventilation during treadmill locomotion in a terrestrial turtle *Terrapene carolina*. Journal of Experimental Biology 206: 3391-3304 (2003) Figs. 1-3, 6 and 7.
Azizi, M and T. Landberg. Effects of Metamorphosis on the Aquatic Escape response of the Two-Lined Salamander, *Eurycea bislineata*, Journal of Experimental Biology 205 (2002).
McCormick, Steven D. Endocrine Control of Osmoregulation in Teleost Fish. American Zoologist 41:781-794 (2001) Illustration on page 783.
Druziski, Kelly A. and E.L. Brainerd. Buccal oscillation and lung ventilation in a semi-aquatic turtle, *Platysternon megacephalum*. Zoology 104 (2001) 143-153 Illustration on page 146.
Tentaculata, a newsletter for caecilian researchers, (4) 1999

ILLUSTRATIONS IN POSTER PRESENTATIONS

Brainerd EL and T. Landberg 2001. Ventilatory Mechanisms of an Elongate Aquatic Salamander, *Amphiuma tridactylum*. University of Massachusetts (Amherst, MA) The Society for Integrative and Comparative Biology (Chicago, IL).
O'Reilly JC, Kley NJ, Richmond AM, Brainerd EL 2001. Prey Capture Kinematics in *Chelus fimbriatus* (Testudines: Pleurodira) University of Massachusetts (Amherst, MA) The Society for Integrative and Comparative Biology (Chicago, IL).

ILLUSTRATIONS FOR PRESENTATIONS AT PROFESSIONAL MEETINGS

Kley NJ, JC O'Reilly, AM Richmond, EL Brainerd 1999. Morphological Specializations of the Feeding Apparatus in the Matamoras (*Chelus fimbriatus*). The Society for Integrative and Comparative Biology, Division of Vertebrate Morphology, Northeast regional meeting (Providence, RI).

PRESENTATIONS AT PROFESSIONAL MEETINGS

Efficiency and Efficacy of Vernal Pond Amphibian Survey Techniques, presented to the Metropolitan District Commission (Natural Resources Conservation) University of Massachusetts (Amherst, MA) Oct 2001.

RESEARCH SOCIETIES

The Society for Integrative and Comparative Biology
The Society for the Study of Amphibians and Reptiles
Tentaculata, Caecilian Research

REFERENCES

Furnished upon request

For more information, or to see my abilities as an illustrator, graphic and/or web designer, please see my website www.mandica.com

CURRICULUM VITAE - DONALD L. DeANGELIS

Professional Preparation

Undergraduate: Massachusetts Institute of Technology, Cambridge, Massachusetts; Physics;
B. S. 1966
Graduate: Yale University, New Haven, Connecticut; Engineering and Applied Science;
Ph. D. 1972

Appointments

12/94 - present Ecologist, U. S. Geological Survey, Florida Integrated Science Centers, Miami, FL
12/94 - present Research Faculty Associate Professor, Department of Biology, University of Miami
11/93 - 12/94 Collaborating Scientist, Oak Ridge National Laboratory and The University of
Tennessee
3/93 - 7/93 Visiting Scientist, The Institute for Wildlife and Environmental Toxicology, Clemson
University
6/88 - 11/93 Senior Staff Member II, Environmental Sciences Division (ESD), Oak Ridge National Laboratory
(ORNL)
3/88 Guest Scholar, Kyoto University
9/83 - 6/88 Senior Staff Member I, ESD-ORNL
10/81 - 1/82 Visiting Scientist, Ecosystem Research Center, Cornell University
7/74 - 8/83 Research Staff Member, ESD-ORNL
6/73 - 7/74 Scientific Associate, Institute for Soil Science and Forest Fertilization, University of Goettingen,
West Germany
2/72 - 6/73 Presidential Intern, Oak Ridge National Laboratory

Major Current Professional Activity

Coordinator, Across Trophic Level System Simulation (ATLSS) Program of USGS

Other Recent Professional Activities

Editorial Board, *Ecological Complexity*, 2003-present
Editorial Board, *Ecosystems*, 1998-present
Editorial Board, *The American Naturalist*, 1998-present
Editorial Board, *Mathematical Biosciences*, 1988-present
Editorial Board, *Ecology and Ecological Monographs*, 1992-1995
Editorial Board, *Nonlinear World*, 1993-1994
Editorial Board, *Journal of Aquatic Stress and Recovery*, 1996-present
North American Editor, Series in Populations and Communities,
Chapman and Hall, London, 1992-2001
Panel member, National Science Foundation postdoctoral fellowships in computational biology, 1993
Review team member, National Science Foundation, Northern Lakes Long Term Environmental
Research site, 1993
Review team member, Swedish Natural Science Council, Swedish research in aquatic ecology, 1993
Review Panel, Improvements in Applications of Models in Risk Assessment Workshop.
Chemical Manufacturers Association, May 17-18, 2000
Editorial Board, *Everglades: The Ecosystem and Its Restoration*. St. Lucie Press, 1994
Associated Editor, *Food Webs: Dynamics and Structure*. Symposium Proceedings. Chapman and Hall, New
York, 1994.
Member, MacArthur Award Committee of the Ecological Society of America, 1997-2000.
Review Panel, U. S. Environmental Protection Agency's Peer Review Panel for Wildlife Risk Assessment, 2001
Reviewer for Model Assessment, Rocky Mountain National Park, 2001
Scientific Advisory Committee, ECOSUD 2001
Participant, Workshop for Improving Environmental Benefits Analysis, U. S. Army Corps of Engineers, Boulder,
Colorado, July, 2001

Review Panel Member, Peer review of EPA NHEERL's Western Ecology Division, 2001- present
Review Panel Member, NOAA Coastal Ocean Program, 2002
Review Panel Member, Review of AQUATOX Model, for EPA, 2002.
Review Panel Member, Pacific Estuarine Ecosystem Indicator Research, 2002-present

Relevant Publications (out of 154 books, open-literature papers and book chapters)

DeAngelis, D. L., W. M. Post, and C. C. Travis. 1986. Positive Feedback in Natural Systems. Springer Verlag, New York, New York, 290 pp.

DeAngelis, D. L. 1992. Dynamics of Nutrient Cycling and Food Webs. Chapman and Hall, London. 270 pp.

DeAngelis, D. L., and L. J. Gross (eds.). 1992. Individual-Based Models and Approaches in Ecology. Routledge, Chapman and Hall, New York.

Mooij, W. M., R. E. Bennetts, W. M. Kitchens, and D. L. DeAngelis. 2002. Exploring the effect of drought extent and interval on the Florida snail kite: Interplay between spatial and temporal scales. *Ecological Modelling* 149 (1-2):25-39.

DeAngelis, D. L., L. J. Gross, M. A. Huston, W. F. Wolff, D. M. Fleming, E. J. Comiskey, and S. Sylvester. 1998.

Landscape modeling for Everglades ecosystem restoration. *Ecosystems* 1:64-75.

Fleming, D. M., W. F. Wolff, and D. L. DeAngelis. 1994. The importance of landscape heterogeneity to a colonial wading bird in the Florida Everglades. *Environmental Management* 18:743-757.

DeAngelis, D. L., K. A. Rose, and M. A. Huston. 1994. Individual-oriented approaches to modeling ecological populations and communities. Pp. 390-410, in S. A. Levin (ed.), *Frontiers in Mathematical Biology. Lecture Notes in Biomathematics* 100, Springer-Verlag, Berlin.

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Educational history:

B. A. in Zoology, Rutgers University, New Jersey, 1971
Ph. D. in Vertebrate Zoology, University of Toronto, Canada, 1975, minors in Statistics and Vertebrate Paleontology.

Awards

American Society of Zoologists= D. Dwight Davis Award for outstanding research, 1974.

Areas of expertise:

Everglades Ecology, Wetlands Ecology, Restoration Ecology, Wildlife Biology, Vertebrate Zoology, Herpetology, Field Ecology, Natural Resources Management, Environmental Biology, Plant Community Ecology, Bio-statistics and Multivariate Analysis, Ecological Experimental Design.

Examples of Professional activities:

- Member, National Academy of Sciences, National Research Council, Ocean Studies Board=s Committee to review the Florida Keys Carrying Capacity Study of 2000-2002.
- Member, U.S. Fish & Wildlife Service=s Multi-Species Recovery Implementation Team Committee (MERIT) 2000 - present.
- Florida Wildlife Federation, Board of Directors.
- National Wild Turkey Federation (NWTF), District Director
- Member Technical Review Team for Environmentally Endangered Lands Program of Miami-Dade County.
- Pre-qualified Everglades Expert for 1997 - 1999 in Expert Assistance Pool for South Florida Water Management District.

Employment history:

- Department of Zoology and Institute of Animal Behavior, Rutgers University, 1968 - 1971. Research Assistant
- University of Toronto, 1971 - 1975, Demonstrator of Zoology.
- Department of Zoology, The Ohio State University, 1975 - 1980. Assistant Professor,
- Florida International University, 1980 - 1984. Director, Environmental Studies Program,
- Florida International University, Department of Biological Sciences, 1980 - 1997. Associate Professor.
- National Park Service, 1995. Ecologist.
- President and Chief Scientist, Everglades Research Group, Inc. 1991 - present.

Professional Society memberships:

American Society of Ichthyologists and Herpetologists
The Wildlife Society
Florida Native Plant Society
Society of Wetland Scientists

Examples of experience with applied ecological issues:

1. Permits from U.S. Fish and Wildlife Service; U.S. National Park Service, Florida Game and Fresh Water Fish Commission for:
 - capture, marking, measuring and scientific study of alligators in southern Florida, including Everglades National Park.

- capture marking, and scientific study of sea turtles on Bill Baggs - Cape Florida State Recreation Area.
 - capture, marking, and scientific study of Indigo Snakes in Everglades National Park.
 - capture, surgical implantation of radio transmitters, and radio tracking Eastern Diamondback rattlesnakes in Everglades National Park.
2. US Army Corps of Engineers' workshop on Environmental Benefits to Everglades National Park from Hydrological restoration of the Shark River Slough, Invited participant for preparation of statement on the status of the American Alligator in Everglades National Park, 1987.
 3. The State of Florida's Southern Everglades Technical Committee for restoration of the Everglades, SETEC. Member from 1986-88.
 4. Dade County's Western Well Field Technical Advisory Committee, Member from 1987-1992.
 5. Ad-Hoc working advisory committee for development of the Environmentally Endangered Lands, EEL, ordinance for Metropolitan Dade County, 1991-1992.
 6. Member of Florida Dept. of Environmental Protection committee on the impact of exotic animals in Florida.
 7. Invited participant/presenter at National Audubon Society's workshop on development of Water Preserve Areas (Lower East Coast Buffer Zones) for Everglades Restoration, 1996.
 8. Invited participant in panel on Everglades Hydrological Issues for Everglades Coalition Annual Meeting, 1999.
 9. Invited participant in panel on AHot Topics@ in Miami-Dade County for Everglades Coalition Annual Meeting, 2002.

Publications:

1. Dalrymple, G. H. 1970. Caddis fly larvae feeding upon the eggs of *Ambystoma t. tigrinum*. **Herpetologica** 1970:128-129.
2. Hassinger, D.D., J.D. Anderson and G.H. Dalrymple. 1970. The early life history and ecology of *Ambystoma tigrinum* and *Ambystoma opacum* in New Jersey. **American Midland Naturalist** 1970:474-495.
3. Anderson, J.D., D.D. Hassinger and G.H. Dalrymple. 1971. Natural mortality of eggs and larvae of *Ambystoma t. tigrinum*. **Ecology** 1971:1107-1112.
4. Anderson, J.D., D.D. Hassinger and G.H. Dalrymple. 1971. The egg-alga relationship in *Ambystoma t. tigrinum*. **Herpetological Review** 3:76.
5. Dalrymple, G.H. 1974 Variation in the cranial feeding mechanism of *Trionyx*. **American Zoologist** 14:4 (abstract).
6. Dalrymple, G.H. 1976. Durophagic adaptations of *Dracaena guianensis*. **Herpetological Review** 7:2 (abstract).
7. Dalrymple, G.H. 1977. Intraspecific variation in the cranial feeding mechanism of turtles of the genus *Trionyx*. **Journal of Herpetology** 11:255-285.
8. Dalrymple, G.H. 1979. On the jaw mechanism of the snail-crushing lizards, *Dracaena*, Daudin, 1801. **Journal of Herpetology** 13:301-311.
9. Dalrymple, G.H. 1979. Packaging problems of head retraction in trionychid turtles. **Copeia** 1979:655-660.
10. Butler, J.A., G.H. Dalrymple and A. Hinko. 1980. Early spring feeding habits and comments on the physiological ecology of the queen snake, *Regina septemvittata*, in central Ohio. **Jour. New York Herpetological Society** 16:3-9.
11. Reichenbach, N.G. and G.H. Dalrymple. 1980. A reconsideration of competition in snakes. **Journal of Herpetology** 14:409-412.
12. Dalrymple, G.H. 1980. Comments on the density and diet of a giant anole, *Anolis equestris*. **Journal of Herpetology** 14:412-415.

13. Reichenbach, N.G. and G.H. Dalrymple. 1981. Herpetological records from a relict prairie in Ohio. **Herpetological Review** 12:1.
14. Dalrymple, G.H. and N.G. Reichenbach. 1981. Interactions between the prairie garter snake (*Thamnophis radix*) and the common garter snake (*Thamnophis sirtalis*) in Killdeer Plains Wildlife Area, Wyandot County, Ohio. Pp.244-250 in: **Proceedings of the Sixth North American Prairie Conference**, 1978. Edited by Stuckey and Reese, Ohio Biological Survey, Columbus.
15. Dalrymple, G.H. 1982. Biology of the Reptilia, Vol.11. Chondrocrania, axial muscles, muscle fine structure. A Critical Review. **Herpetologica** 38:337-338.
16. Dalrymple, G.H. and N.G. Reichenbach. 1985. Management of an endangered species of snake in Ohio, U.S.A. **Biological Conservation** 30:195-200.
17. Dalrymple, G.H., J.E. Juterbock and A.L. LaValley. 1985. The function of the atlanto-mandibular ligaments of desmognathine salamanders. **Copeia** 1985: 254-257.
18. Dalrymple, G.H., J.C. Hampp and D.J. Wellins. 1985. Male-biased sex ratio in a cold nest of a hawksbill sea turtle (*Eretmochelys imbricata*). **Journal of Herpetology** 19:158-159.
19. Reichenbach, N.G. and G.H. Dalrymple. 1986. Energy use, life histories, and the evaluation of potential competition in two species of garter snake. **Journal of Herpetology** 20:133-153.
20. Dalrymple, G.H. and T.M. Steiner. 1988. The status and ecology of the amphibians and reptiles of the Long Pine Key-Paradise Key region of Everglades National Park. In: **Wildlife in the Everglades and Latin American Wetlands, Proceedings of the First Everglades National Park Symposium**, 1985. Edited by G.H. Dalrymple, W.B. Loftus, and F.S. Bernardino, Jr.. Florida International University, Miami.
21. Dalrymple, G.H. 1988. The herpetofauna of the Long Pine Key, Everglades National Park, in relation to vegetation and hydrology. Pages 72-86, In **Management of Amphibians, Reptiles and Small Mammals in North America**. U.S. Dept. Agric. Forest Service. Gen. Tech. Rep. RM-166. Wash. D.C.
22. Dalrymple, G.H. 1990. Habitat suitability index model for the Oak Toad, *Bufo quercicus*. Pp. 17-51 In **Habitat Suitability Models for the Bird Drive Everglades Basin Habitat Evaluation Process**. Edited by W. Richter and E. Myers. Dade County Dept. of Environmental Resources Management Technical Report T1-90.
23. Dalrymple, G.H., T.M. Steiner, R.J. Nodell and F.S. Bernardino, Jr. 1991. Seasonal activity of the snakes of Long Pine Key, Everglades National Park. **Copeia** 1991:294-302.
24. Dalrymple, G.H., F.S. Bernardino, Jr., T.M. Steiner, and R.J. Nodell. 1991. Patterns of species diversity of snake assemblages, with data on two Everglades snake assemblages. **Copeia** 1991:517-521.
25. Bernardino, F.S. and G.H. Dalrymple. 1992. Seasonal activity and road mortality of the snakes of the Pahay-okee wetlands of Everglades National Park, U.S.A. **Biological Conservation** 62:71-75.
26. Dalrymple, G. H. 1993 Book Review: "The Rare and Endangered Species of Florida. Volume 3: Amphibians and Reptiles." University Presses of Florida. **Copeia** 1993:
27. Dalrymple, N.K., G.H. Dalrymple, and K.A. Fanning. 1993. On the vegetation of restored and unrestored rock-plowed wetlands of the East Everglades of southern Florida. **Restoration Ecology** 1:220-225.
28. Dalrymple, G.H. 1994. Non-indigenous amphibians and reptiles in Florida. Pp.67-78, In **An Assessment of Invasive Non-Indigenous Species in Florida's Public Lands**. Project Directors D.C. Schmitz and T.C. Browns. Florida Dept. of Environmental protection. Division of Aquatic Plant Management. Technical Report TSS-94-100. Tallahassee, FL.
29. Dalrymple, G. H. 1996. On the ecology and growth of the American alligator in the Shark Valley Canal of Everglades National Park. **Copeia** 1996:212-216.
30. Dalrymple, G.H., and O.L. Bass, Jr. 1996. The diet of the Florida panther in Everglades National Park, Florida. **Bull. Florida Mus. Nat. Hist.** 39(5):173-193.
31. O'Hare, N. K. and G. H. Dalrymple. 1997. Wildlife in southern Everglades Wetlands invaded by melaleuca (*Melaleuca quinquenervia*). **Bull. Florida Mus. Nat. Hist.** 41(1):1-68.
32. Dalrymple, G. H. 1998. Snake community composition and use of the main park road in the Pahayokee Region of Everglades National Park during high water conditions in 1995. Pages 71-76 in: **Ecological assessment of the 1994-1995 high water conditions in the southern Everglades**. Edited by T. V. Armentano. South Florida Natural Resources Center, Everglades National Park, Homestead, FL.
33. Dalrymple, G. H. 1998. The effect of prolonged high water levels in 1995 on the American alligator in the Shark Valley area of Everglades National Park. Pages 125-135 in: **Ecological assessment of the 1994-1995 high water conditions in the southern Everglades**. Edited by T. V. Armentano. South Florida Natural Resources Center, Everglades National Park, Homestead, FL.

34. Gaines, M., G. Dalrymple, and D. DeAngelis. 1999. Computer simulation modeling of intermediate trophic levels for across trophic level system simulations of the Everglades/Big Cypress region. Pages 2.1-21 in U.S. Geological Survey Program on the South Florida Ecosystem. Proc. of South Florida Restoration Science Forum, May 17-19, 1999. Boca Raton, FL. **U.S.G.S Open-File Report 99-181**. Tallahassee, FL.
35. Dalrymple, G. H. and N. K. O'Hare. 2002. Success criteria and successional trends on restored wetlands in the Hole-in-the-Donut in Everglades National Park. Florida Scientist. Vol. 65. Suppl.1:5. Abstract.
36. O'Hare, N. K. and G. H. Dalrymple. 2002. Apple snail use of short-hydroperiod restored wetlands. Florida Scientist. Vol. 65. Suppl.1:8. Abstract.
37. Keith, B. K., N. K. O'Hare, and G. H. Dalrymple. 2002. Mammal use of the restored wetlands in Everglades National Park. Florida Scientist. Vol. 65. Suppl.1:9. Abstract.
38. National Research Council. Committee project. 2002. **A Review of the Florida Keys Carrying Capacity Study**. 166 pp. National Academy Press. Washington, D.C. (One of 9 co-authors).
39. Diffendorfer, J., P. Richards, G. Dalrymple, and D. DeAngelis. 2001 Applying linear programming to estimate fluxes in ecosystems or food webs: an example from the herpetological assemblage of the freshwater Everglades. **Ecological Modeling** 144:99-120.
40. Clarke, A. L. and G. H. Dalrymple. 2003. \$7.8 billion for Everglades restoration: why do environmentalists look so worried? **Population and Environment** 24:541-569.
41. Dalrymple, G. H. 2003. Abstract: The Eastern Diamondback Rattlesnake (*Crotalus adamanteus*) in Everglades National Park. Pages 38-41 in Conservation Guide to the Eastern Diamondback Rattlesnake *Crotalus adamanteus* by W. W. Timmerman and W. H. Martin. **Society for the Study of Amphibians and Reptiles Herpetological Circular** 32.
42. Dalrymple, G. H., R. F. Doren, N. K. O'Hare, M. K. Norland, and T. V. Armentano. 2003. Plant colonization after complete and partial removal of disturbed soils for wetland restoration of former agricultural fields in Everglades National Park. **Wetlands** 23:1015 - 1029.

Examples of Final Technical Reports:

1981. The reproductive ecology of sea turtles at Cape Florida State Park, Key Biscayne, FL. for 1981. Final report submitted to Florida Dept. of Natural Resources.
1986. Community ecology of the herpetofauna of Long Pine Key, Everglades National Park, in relation to vegetation and hydrology. Final report submitted to Everglades National Park. 80 pp.
1988. An evaluation of the ecological effects of early drawdowns of the L31W canal on Taylor Slough, Everglades National Park. Report for Everglades National Park, 5 pp.
1988. An ecological analysis of Greynolds Park. Final report submitted to Dade County Dept. of Parks and Recreation. 114 pp., plus 17 figures and 20 tables.
1988. Habitat suitability index model: oak toad. Submitted to Dade County Dept. of Environmental Resources Management. 34 pp.
1988. Alligator Populations. In: Analysis of Environmental Benefits to Everglades National Park from Hydrological Restoration of Shark River Slough, White Paper. Incorporated into US Army Corps of Engineers final General Design Memorandum for Shark Slough and East Everglades revised water delivery plan.
1989. Ecological Study of Wetland Mitigations in Dade Co., Florida. Final report submitted to The Joint Center for Environmental and Urban Problems, Florida Atlantic University - Florida International University.
1994. In-faunal analysis of wetland restoration in the Hole-in-the-Donut in Everglades National Park. Final report submitted to Everglades National Park.
1998. Impacts of high water on plant communities and wildlife in Water Conservation Area 3A, and environs. Final report to Miccosukee Tribe of Indians of Florida.
1998. Freshwater marshes and Prairies. In: U. S. Fish and Wildlife Service South Florida Multi-Species Recovery Plan, Volume II: The communities. 1998.
1999. Vegetation and Wildlife monitoring results for wetland restoration in the Hole in The Donut in Everglades National Park May 1, 1998-April 30, 1999. Annual Report to Everglades National Park.
2000. Vegetation and Wildlife monitoring results for wetland restoration in the Hole in The Donut in Everglades National Park May 1, 1999-April 30, 2000. Annual Report to Everglades National Park.

- 2000. Herbivory on the federally endangered Sargent's Cherry Palm in Biscayne National Park. Final report to Biscayne National Park.
- 2001. Vegetation and Wildlife monitoring results for wetland restoration in the Hole in The Donut in Everglades National Park May 1, 2000- April 30, 2001. Annual Report to Everglades National Park.
- 2001. American alligator nesting and reproductive success in Everglades National Park. An analysis of the systematic reconnaissance flight data (SRF) from 1985 B 1998. Final report for Cooperative Agreement #CA528-03-9013 between Everglades National Park and The University of Miami Department of Biology. August, 2001.

Examples of public and professional presentations:

- 1987- The natural history and conservation of Florida's sea turtles. American Littoral Society, South Florida Chapter. Key Biscayne. Invited speaker.
- 1987- South Florida's remaining natural habitats. Native Plant Society, Dade Co. Chapter Annual Meeting. Invited speaker.
- 1990- "Vanishing Biota of the Everglades" for League of Environmental Educators, November Annual Meeting, Everglades National Park, Invited Speaker.
- 1990 -"Wetlands Restoration in the East Everglades" at Broward County Inter-Agency meeting on Wetlands September, 1990 with K. Fanning..
- 1990- "Wetland restoration and faunal integrity". Presented paper at annual meeting of the Florida Native Plant Society. Invited Speaker.
- 1991- "Wetland restoration in the Everglades". Invited Speaker. Tropical Audubon Society Workshop on Mitigation.
- 1991- "The Collapse of the Everglades Ecosystem: A Diversity of Issues and Indictments". Archie and Marjory Car Lecture in Biological Conservation. University of Florida. September. Invited Speaker.
- 1995. The Eastern Diamondback Rattlesnake in Everglades National Park. Society for the Study of Amphibians and Reptiles. 38th annual meeting.
- 1996. The effect of high water in 1994-1995 on the snake community of the Pahayokee Region of Everglades National Park. National Audubon Society Conference, Florida International University, Miami.
- 1996. The effect of high water in 1994-1995 on alligators in Everglades National Park. Conference on high water impacts in the Everglades. FIU.
- 1997. In-faunal study of pilot wetland restoration in the Hole-in-the-Donut, Everglades National Park. Society For Ecological Restoration, 9th annual international conference, Fort Lauderdale, Florida, November 1997.
- 1998. Limits and off limits of Broward County's unrestricted growth. Broward Chapter - Sierra Club. 11/3/98. Invited Speaker.
- 1998. Wetland succession and mitigation issues in the southern Everglades. University of Miami, Dept. of Biology. 11/16/98. Invited Speaker.
- 1999. Everglades restoration and the Central and South Florida Project Comprehensive Review Study: issues and problems. Sierra Club Miami Group. Coral Gables. 12/98. Invited Speaker.
- 1999. The Central & South Florida Project Review Study. Invited speaker Miami-Dade County School's Youth Environmental Senate Symposium.
- 2000. Everglades Coalition Annual Meeting, Naples, Florida. Panelist on Everglades Restoration hydrological issues panel. Invited Speaker.
- 2000. Florida Native Plant Society. Annual Meeting, May, 2000. Miami-Dade County. Wetland Restoration in the Hole in the Donut of Everglades National Park. Invited Speaker.
- 2000. Society of Wetland Scientists. August, Annual Meeting. Quebec City, Quebec. Successional dynamics of restored wetlands in the Hole in the Donut of Everglades National Park. G. H. Dalrymple, A. Van Grondelle, and M.R. Norland.
- 2000. American Society of Agronomy. Nov. 2000. Minneapolis, MN. Restoration of former agricultural lands in Everglades National Park. M.R. Norland, G. H. Dalrymple, N. K. O'Hare.
- 2000. Greater Everglades Ecosystem Restoration Science Conference, Naples, FL. Dec. 2000. Adaptive management strategies for the construction and engineering phase of the Hole-in-the-Donut wetland

- restoration and mitigation program - Everglades National Park C Michael R. Norland, George Dalrymple and Nancy O'Hare,
2000. Greater Everglades Ecosystem Restoration Science Conference, Naples, FL. Dec. A method for successful wetland restoration on former farmlands dominated by Brazilian pepper in the Hole in the Donut of Everglades National Park C N. K. O'Hare, G. H. Dalrymple, Everglades Research Group, Inc. Homestead, FL; M. R. Norland, Everglades National Park, Homestead, FL.
2000. Greater Everglades Ecosystem Restoration Science Conference, Naples, FL. Dec. American alligator nesting and reproductive success in Everglades National Park. B G. H. Dalrymple, O.L. Bass, Jr., D. M. Fleming, and M. S. Gaines, University of Miami, Coral Gables, FL.
2001. 8th Annual Meeting of The Wildlife Society, Reno/Tahoe, NV. Sept. 25 B 29. American alligator nesting and reproductive success in Everglades National Park. An analysis of the systematic reconnaissance flights data (SRF) 1985 B 1998. G. H. Dalrymple, O.L. Bass, Jr., D. M. Fleming, and M. Alvarado.
2002. 66th Annual Meeting. Florida Academy of Sciences, Miami, FL. March 7-9. Success criteria and successional trends on restored wetlands in the Hole-in-the-Donut in Everglades National Park. Florida Scientist. Vol. 65. Suppl.1:5. Abstract. Dalrymple, G. H. and N. K. O'Hare.
2003. Fourth Florida Agro-Ecology Conference: "Ecosystem Restoration and Stewardship", St. Augustine, FL Jan. 2003. "Success criteria and successional trends for restoration of wetlands on former agricultural fields of the Hole-in-the-Donut in Everglades National Park."
2004. University of Florida, Natural Resource Leadership Institute meeting Jan. 2004. Participant on panel: The Bird Drive Everglades Basin Special Area Management Plan (SAMP). Flamingo, Florida.
2004. Everglades Coalition Annual Meeting, Miami Beach, Florida. Jan. 2004. Participant on panel: Angling for Access: recreational issues and Everglades restoration.

Example of popular articles:

Getting up close and personal with the Eastern Diamondback Rattlesnake. Tropical Trails, Winter 1997, pages 5-13. Dade County Parks and Recreation Department. Miami.

Editorial reviews for peer reviewed journals including:

Bulletin of the Florida Museum of Natural History
Copeia
Ecology
Florida Scientist
Herpetological Natural History
Herpetologica
Journal of Herpetology
Southeastern Naturalist
Weed Technology

Examples of grants and contracts:

1. An ecological study of the plains garter snake, Thamnophis radix, in Ohio. Ohio Dept. of Natural Resources, Division of Wildlife, 1979-1980.
2. Management of loggerhead sea turtle (Caretta caretta) reproduction on Key Biscayne. Awards from both the Joint Center for Environmental and Urban Problems & Florida International University Foundation, 1980-1981.
3. Community ecology of the herpetofauna of Long Pine Key, Everglades National Park in relation to vegetation and hydrology. 1984-1986. U.S. National Park Service.
4. Community ecology of the reptiles and amphibians of Long Pine Key-Paradise Key, Everglades National Park. 1984-1985. Florida International University Foundation.
5. Wildlife in the Everglades and Latin American Wetlands - an international conference, jointly funded by UNESCO and U.S. National Park Service. 1984-1985. March, 1985 in Miami.
6. Editor: Proceedings of the first Everglades National Park Symposium, Wildlife in the Everglades and Latin American Wetlands. 1986-1988. U.S. National Park Service.
7. The reproductive ecology of the alligator in the Everglades. 1985-1986. U.S. National Park Service.

8. Diversity and abundance of small mammals in Everglades National Park. 1985-1986. U.S. National Park Service.
9. An ecological analysis of Greynolds Park. 1987-1988. Dade County Dept. of Parks and Recreation.
10. A Habitat Suitability Index Model for the Oak Toad in the Bird Drive Everglades Basin. 1987-1988. Dade County Dept. of Environmental Resources Management.
11. Quantitative ecological study of wetland restoration projects. 1988-1989. F.A.U.-F.I.U. Joint Center for Environmental and Urban Problems.
12. Ecological evaluation of wetlands restoration on wildlife in the Hole-in-the-Donut region of Everglades National Park. Everglades National Park. 1990-present.
13. Biostatistical analyses of coral reef restoration efforts on benthic invertebrates and fishes off Sunny Isles, Dade Co., Florida. G. M. Selby and Associates: for Dade Co., Fl., Dept. of Environmental Resources Management 1990-1995.
14. Analysis and ordination of Natural Forest Communities (NFC program), for Dade Co., Fl. Dept of Environmental Resources Management: Tree Section. 1991-1992.
15. Ecological assessment of impacts from monopole antennae for cellular phone network of Bell-South Mobility, Inc. for G. M. Selby and Assoc., Inc. 1993.
16. Taxonomic identifications of imported animals for U.S. Fish and Wildlife Service, Div. of Law Enforcement. 1992-1994.
17. Rock Mining Industries Lake Belt Study Plan: Wildlife Studies. Funded through Dade County, Dept. of Environmental Resources Management for multi agency cooperative program with Rock Mining Industry Association. 1993-1996.
18. Metcalf and Eddie, Inc. M&E PIECO: Removal and translocation of native fauna from canals at Miami International Airport. 1994.
19. Herpetological data analyses empirical data for food webs and population attributes for Across Trophic Level System Simulation - ATLSS - modeling for Everglades restoration. National Biological Service, USGS. 1996-1998.
20. Florida Power and Light, Inc. Expert evaluation of South Dade Mitigation Bank. 1996 & 1999.

21. Biological Monitoring of wetland restoration in the Hole-in-the Donut region of Everglades National Park. 1997- 2003.
 22. An evaluation of wildlife diversity and wildlife habitat at Dade County=s Chapman Field Park. Dade County Parks and Recreation Dept. 1997-1998.
 23. Assessment of feral cat populations and population status of upland and wading birds at Dade County=s Greynolds Park. Dade County Parks and Recreation Dept. 1997-1998.
 24. Wildlife habitat values in relation to master plan development for Matheson Hammock Park. Dade County Parks and Recreation Dept. 1997-1998.
 25. Evaluation of high water impacts in WCA 3A. Miccosukee Tribe of Indians of Florida. 1998.
 26. Biological monitoring of wetland restoration in the Hole-in-the-Donut, Everglades National Park. Everglades National Park, National Park Service. 1997-present.
 27. Preparation of the chapter on Freshwater Marshes and Prairies and sections of an introductory chapter on southern Florida for the U. S. Fish and Wildlife Service=s Multi-Species Recovery Plan Volume II. 1998.
 28. Review of the plant and wildlife components of the Army Corps of Engineers= Draft Hydro-Geomorphic Model, HGM, for the Everglades Wetlands, 1998.
 29. Consulting contract from University of Maryland=s Center for Wetland Economics (Dr. Dennis King) at Chesapeake Bay Biological Lab.: Wetland mitigation economic valuation methods and case histories in southwest Florida. 1999.
 30. Herbivory on the federally endangered Sargent=s Cherry Palm in Biscayne National Park. National Park Service 1999-2000.
 31. Statistical analyses of American alligator nesting data in Everglades National Park in relation to geographic, hydrologic and temporal variation. Grant awarded through University of Miami, Department of Biology. 1998-2001.
- On-going contracts: (see 21 above) Biological Monitoring of wetland restoration in the Hole-in-the Donut region of Everglades National Park. 1997- 2004.

Danté Bruce Fenolio

Education

2000-2003: University of Oklahoma – MS, zoology

1996-1994: University of California Santa Cruz – BA, Environmental Studies/Biology

1993-1990: De Anza Junior College

Grants and Awards

2003/2004: Blanch Adams Zoological Annual Scholarship – University of Oklahoma \$1,000.00

2003/2004: Oklahoma Department of Wildlife Conservation – Survey of the grotto salamander, *Typhlotriton spelaeus* (Danté Fenolio as objective leader).

Part of: Bergery, L. Surveys and studies of some crayfish and the grotto salamander in Oklahoma.

\$7,935.00

2003: Blanch Adams Zoological Summer Scholarship – University of Oklahoma \$2,500.00

2002: Highlands Biological Station, Half Tuition Scholarship \$200.00

2002: University of Oklahoma Graduate Student Senate Research Grant \$250.00

2001: Oklahoma City Zoological Society Partial Sponsorship – French Canopy Raft Project in Madagascar \$3,500.00

2001: Oklahoma City Zoo – Wildlife Conservation Fund – French Canopy Raft Project in Madagascar \$1,000.00

2001: Solicited Private Donations – French Canopy Raft Project in Madagascar \$2,000.00

2001: Blanch Adams Zoological Summer Scholarship – University of Oklahoma \$2,500.00

2001: University of Oklahoma Graduate Student Senate Research Grant \$125.00

2000: Private Industry Grant, Naturae – Brasil: \$1,500.00

2000: University of Oklahoma Graduate Student Senate Research Grant \$400.00

2000: Oklahoma Department of Wildlife Conservation Research Grant \$1,000.00

1994: Josef Laszlo Memorial Award - International Herpetological Symposia – New Orleans, LA

Peer Review Publications

Andreone, F., D.B. Fenolio, M.E. Walvoord. 2003. Two unknown arboreal frogs (genus *Platypelis*) described from the rainforests of northeastern Madagascar (Microhylidae: Cophylinae). Current Herpetology, 22(2):91-100.

Fenolio, D. 2001. *Bufo paracnemis* - Feeding Behavior. Herpetological Review 32(2): 101.

Fenolio, D. 1996. Captive Reproduction of the Orange-legged Monkey Frog (*Phyllomedusa hypocondrialis*), and Development of a Protocol for Phyllomedusine Frog Reproduction in the Laboratory. *Advances in Herpetoculture* - Special Publications of the International Herpetological Symposium, Inc. 1: 13-21.

Submitted Manuscripts

Cumberlidge, N.D., D. Fenolio, M. Walvoord, and J. Stout. First report of tree climbing crabs (Potamonautidae and Sesarmidae) living in phytotelmic microhabitats in the rainforest canopy in Madagascar. *Journal of Tropical Ecology*.

Fenolio, D., M. Walvoord, J. Stout, and F. Andreone. A new species of *Platypelis* from the Masoala Peninsula, northeastern Madagascar. *Proceedings of the Biological Society of Washington*.

Graening, G., H. Hobbs III, M. Slay, D. Fenolio, S. McGuinness, and S. Hensley. Range extension and status update of January River's blind crayfish, *Cambarus tartarus* (Decapoda: Cambaridae), endemic to three cave streams in Oklahoma. *The Southwestern Naturalist*.

Fenolio, D., N. J. Da Silva, and H. L. Silva. A review of *Leptodactylus pustulatus* with notes on its ecology in the Cerrado of Brasil. *Phyllomedusa*.

Fenolio, D. and Trauth, S. Biology and ecology of *Typhlotriton spelaeus* – species account. *Conservation of North American Amphibians*. Lannoo, M. - Ed.

Manuscripts in Preparations

Holsinger, J.R., G.O. Graening, and D.B. Fenolio. A new species of stygobitic amphipod from the eastern Ozarks.

Fenolio, D. G. Graening, O. Oftedal, and J. Stout. Stable isotope analysis in support of guano as a regular dietary component in a troglobitic salamander.

Graening, G. and D. Fenolio. Stable isotope analysis of trophic interactions in five Ozark subterranean systems.

Manuscripts in Preparations continued

Fenolio, D. A two year population study of the Ozark blind cave salamander, *Typhlotriton spelaeus*.

Fenolio, D. and J. Stout. A population of *Rana palustris* utilizing an Ozark cave as a winter refuge.

Fenolio, D., N. J. Da Silva, and H. L. Silva. Notes on the ecology of three poorly known species of cerrado amphibians.

Fenolio, D., M. Russell, and W. Lamar, A redescription of *Bufo ceratophrys* with notes on its ecology.

Bergey, L., G. Graening, D. Fenolio, and S. Hensley. Bioinventory of the Cave Fauna of the Ozark Plateau National Wildlife Refuge, Oklahoma.

Books in Preparation

Fenolio, D., N. J. Da Silva, and H. L. Silva. Amphibian Fauna of the Upper Tocantins River Valley.

Graening, G.O. and D. Fenolio. Subterranean Biodiversity of the Southwestern Ozark Plateau.

Technical Reports

Bergey, E.A., D.B. Fenolio, and G.O. Graening. 2003. Aquatic cave invertebrate survey Ozark Plateau National Wildlife Refuge and associated areas:1-28. Submitted to: Steve Hensley and the United States Fish and Wildlife Service, Tulsa, Oklahoma.

Published Abstracts

Fenolio, D.B., M.E. Walvoord, J. Stout, and J.E. Randrianirina. 2002. A survey of microhabitats, herpetofauna, and stratification in northeastern Madagascar using the canopy raft program. Joint Meeting of Ichthyologists and Herpetologists, July 3-8, 2002, Kansas City.

Other Publications

Fenolio, D. 2003. Keeping and breeding the three stripe poison frog, tiger morphs. *Reptiles*, July, 11(7):70-77.

Fenolio, D. 2002. Ilha Serra Negra (Black Mountain Island): Part 2. *Reptiles*, Oct., 10(10):74-81.

Fenolio, D. 2002. Ilha Serra Negra (Black Mountain Island): Part 1. *Reptiles*, Sept., 10(9):42-50.

Other Publications – continued

Fenolio, D. 2002. Preparing for a trip to the tropics. *Reptiles*, May, 10(5):30-37.

Fenolio, D. 2002. Fringe Benefits. *Reptiles*, Feb. (10)2: 44-53.

Fenolio, D. 2001. Vivarium Microhabitats. *Reptiles*, Feb. 9(2): 38-43.

Fenolio, D. 2001. Big Mouths: Horned and pyxie frogs. *Reptiles*, Annual 2001: 122-125.

Fenolio, D. 1999. Frogs that Kill. *Vivarium* 11(1): 26-29, 50-51.

Fenolio, D. 1999. Mastering the Masters of Colonization. *Reptiles*, July 1999 7(7):76-83.

Fenolio, D. 1999. A Wet Serenade. *Vivarium* 10(3): 17-20.

Fenolio, D. 1998. The Vanishing Cerrado. *Vivarium* 9(5): 38-42.

Fenolio, D. and Powell, C. 1998. *Dendrobates ventrimaculatus*: A complex of Little Poison-Dart Frogs. *Reptiles*, Aug. 1998: 12-19. Magnificent

Fenolio, D. 1998. Notes on the Captive Reproduction of the Amazonian Milk Frog (*Phrynohyas resinificatrix*). *Reptiles*, Apr. 1998: 84-89.

Fenolio, D. 1998. Beginning Salamander and Newt Keeping. *Reptiles Annual* 1998: 92-105.

- Fenolio, D and Ready, M. 1997. Mystical Monkey Frogs: Sapo's Magic. *Fauna* 1(2): 68-72.
- Fenolio, D. 1997. The Hole Thing: Frog and Toad Microhabitats. *Fauna* 1(1):4-15.
- Ready, M. and Fenolio, D. 1997. A Visit to the Vivarium in Quito Ecuador. *Reptiles*, Jan. 1997: 12-20.
- Fenolio, D. 1997. Beginning Amphibian Keeping: How to Stay Ahead. *Reptiles Annual* 1997: 48-65.
- Fenolio, D. 1996. A Trip to Trinidad and Tobago in Search of Tropical Anurans. *Vivarium* 8(1): 34-39.
- Fenolio, D. and Ready, M. 1996. California: the *Ensatina* State. *Vivarium* 7(4): 32- 37,60.
- Fenolio, D. and Ready, M. 1995. Night Hiking the Río Momón, Perú. *Vivarium* 7(2): 30- 35,54.

Other Publications – continued

- O'Reilly, J., Fenolio, D. and Ready, M. 1995. Limbless Amphibians: Caecilians. *Vivarium* 7(1): 26-29,35-36,52-54.
- Fenolio, D. and Ready, M. 1995. Some Notes on the Pinocchio Toad, *Bufo dapsilis*. *Vivarium* 7(1): 50-51.
- Fenolio, D. and Ready, M. 1995. Natural History of the Mexican Burrowing Frog *Rhinophrynus dorsalis*. *Vivarium* 6(6): 18-21.
- Fenolio, D. and Ready, M. 1995. Giant Salamanders. *Vivarium* 6(5):18-22.
- Fenolio, D. and Ready, M. 1995. Casque Headed Frogs of the Genus *Hemiphractus*. *Vivarium* 6(4): 18-23.
- Fenolio, D. 1995. Some Notes on the Natural History, Captive Husbandry, and Reproduction of the Avocado Harlequin Toad, *Atelopus peruensis* Grey and Cannatella. *American Dendrobatid Group Newsletter* 20: 1-3.
- Fenolio, D. 1994. Natural History and Captive Husbandry Notes on Lehmann's Dart- Poison Frog (*Dendrobates lehmanni*). *Vivarium* 6(3): 52-54.
- Fenolio, D. 1994. Through the Eye of the Amphibian. *Vivarium* 6(2): 18-21.
- Fenolio, D. and Ready, M. 1994. Phyllomedusine Frogs of Latin America: Captive Husbandry and Natural History. *Vivarium* 5(6): 26-29,36-37.
- Fenolio, D. 1994. To Peru in Search of Tropical Anurans. *Vivarium* 5(4):18-21,36.

Professional Experience

- 2004/Spring: (T.A.) Medical Entomology - University of Oklahoma
- 2004/Spring: (T.A.) Introductory Zoology Laboratory - University of Oklahoma
- Dec. 2003 Middle school extension course, "Amphibians" – University of Oklahoma
- 2003/Fall: (T.A.) Introductory Zoology Laboratory - University of Oklahoma
- 2003//Spring: (T.A.) Introductory Zoology Laboratory - University of Oklahoma
- 2002/Fall: (T.A.) Introductory Zoology Laboratory - University of Oklahoma
- 2002/Spring: (T.A.) Introductory Zoology Laboratory - University of Oklahoma
- 2001/Fall: (T.A.) Introductory Zoology Laboratory - University of Oklahoma

2001/Spring: (T.A.) Medical Entomology – University of Oklahoma
 2000-2003: Bioinventory work in Ozarks for Subterranean Biodiversity Project, the United States Fish and Wildlife Service, the Oklahoma Biological Survey, the Nature Conservancy, and the Oklahoma Department of Wildlife Conservation
 2000/Fall: (T.A.) Animal Behavior Laboratory – University of Oklahoma
 2000/Spring: (T.A.) Introductory Zoology Laboratory - University of Oklahoma
 Aug. 1998: Short field methods course for the Catholic University of Goiás, Goiania, Brazil
 1998-present: Environmental consultation / bioinventory work for Naturae/Brasil, Brazil
 1994-2003: Ecotourism guide for Green Tracks Inc.

Invited Presentations

Dec.	2003	Russian Academy of Sciences, St. Petersburg, Russia
Oct.	2003	South Nevada Herpetological Society, Las Vegas, NV
Sep.	2003	International Herpetological Symposium, Houston, TX
Oct.	2002	South Nevada Herpetological Society, Las Vegas, NV
Jun	2002	Oklahoma Herpetological Society, Shawnee, OK
Apr.	2002	Dallas Herpetological Society, Dallas, TX
Mar.	2001	Oklahoma City Zoo Herpetological Conference – Oklahoma City, OK
Nov.	1999	de Saisset Museum, Santa Clara University - Santa Clara, CA
Nov.	1999	South Nevada Herpetological Society – Las Vegas, NV
Sep.	1999	East Texas Herpetological Society – Houston, TX
July	1999	International Herpetological Symposium - San Diego, CA
Nov.	1998	East Texas Herpetological Society/Houston Zoo - Houston, TX
Jan.	1998	North Bay Herpetological Society - Novato, CA
Oct.	1997	Northern California Herpetological Society - Davis, CA
Sep.	1997	West Coast / United States Amphibian Day - San Jose, CA
June	1997	International Herpetological Symposium - Liberia, Costa Rica
Jan.	1997	South Nevada Herpetological Society - Las Vegas, NV
Nov.	1996	San Diego Zoo - San Diego, CA
Sep.	1996	West Coast / United States Amphibian Day - Annual Meeting, San Jose, CA
Feb.	1996	Bay Area Amphibian and Reptile Society - San Jose, CA
Jan.	1996	South Nevada Herpetological Society - Las Vegas, NV
Dec.	1995	Eugene Herpetological Society - Eugene, OR
Sep.	1995	West Coast / United States Amphibian Day - San Jose, CA
April	1995	All Florida Herpetological Conference - Gainesville, FL
Feb.	1995	UC Berkeley's Herpetological Group Meeting - Berkeley, CA
June	1994	International Herpetological Symposium - New Orleans, Louisiana
Nov.	1993	Bay Area Amphibian and Reptile Society - San Jose, CA
Oct.	1990	Bay Area Amphibian and Reptile Society - San Jose, CA

Academic Presentations

Jul. 2002 ASIH/SSAR Joint Meetings, Kansas City, MO: A survey of microhabitats, herpetofauna, and stratification in northeastern Madagascar using the canopy raft program.

Field Experience

Oct./Nov. 2001: **Madagascar** – Herpetological field work on the French Canopy Raft Program
 August 2001: **Brasil** – Herpetological field work for the University Catolica de Goiás and Dr. Nelson Da Silva
 June 2001: **Puerto Rico** – Private industry photographic work
 May 2001: **Bolivia** – Herpetological field work for William Lamar
 Mar./April 2001: **Brasil** – Herpetological field work for the University Catolica de Goiás and Dr. Nelson Da Silva
 July/Aug. 2000: **Brasil** – Herpetological field work for the University Catolica de Goiás and Dr. Nelson Da Silva

Field Experience - continued

Feb. 2000-present: MS project in **Ozark Mts. caves, Oklahoma**, studying grotto salamanders (*Typhlotriton spelaeus*)

Aug. 1999: **Guatemala/Mexico** - Photographic work

July/Aug. 1998: **Brasil** - Herpetological field work for the University Catolica de Goiás and Dr. Nelson Da Silva

June 1998: **Kenya** - Herpetological field work for the University of California Berkeley

June 1998: **Uganda** - Herpetological field work for the University of California Berkeley

Feb./Mar. 1998: **Brasil** - Herpetological field work for the University Catolica de Goiás and Dr. Nelson Da Silva

July 1997: **Costa Rica** - Invitation to speak at the International Herpetological Symposia and photographic work

July 1997: **Panama** - Photographic work

Aug. 1996: **Peru** - Herpetological field work for William Lamar

Aug. 1995: **Peru** - Herpetological field work for William Lamar

July. 1995: **Ecuador** - Herpetological field work for William Lamar

June 1995: **Hawaiian island of Oahu** - Introduced Dendrobatid observations project

April/May/June 1995: UCSC Natural Reserves internship, **Monterey, California** - *Anniella* field study project with Dr. Margret Fusari

Jan./Feb./Mar. 1995: UCSC internship - **Santa Cruz Mts., California**, amphibian survey with Dr. Margret Fusari

July 1994: **Peru** - Herpetological field work for William Lamar

Aug. 1993: **Hawaiian island of Oahu** - Introduced Dendrobatid observations project

June 1993: **Costa Rica** - Herpetological field work for William Lamar

Jan. 1992: **Costa Rica** - Herpetological field work for William Lamar

July 1991: **Peru** - Herpetological field work for William Lamar

Aug. 1990: **Hawaiian island of Oahu** - Introduced Dendrobatid observations project

July 1990: **Trinidad/Tobago** - Photographic work

April 1990: **Anza Borrego Desert, California** - Biological field class/photographic work

June 1989: **Mt. Lassen, California** - Biological field class/photographic work

April 1989: **Anza Borrego Desert, California** - Biological field class/photographic work

April 1988: **Anza Borrego Desert, California** - Biological field class/photographic work

July 1987: **Hawaiian island of Oahu** - Introduced Dendrobatid observations project

Graduate Courses

2002:	Psychological Statistics	– University of Oklahoma
2002:	Plethodontid Salamander Biology	– Highlands Biological Station, University of North Carolina, Chapel Hill
2000:	Evolutionary ecology	– University of Oklahoma
2000:	Conservation biology	– University of Oklahoma
2000:	Professional aspects	– University of Oklahoma

2000: Physiological ecology seminar
 "water balance" –University of Oklahoma
 1999: Animal behavior – University of California Santa Cruz
 1999: Evolution – University of California Santa Cruz

Professional Societies

Society for the Study of Amphibians and Reptiles
 Herpetologists League
 Biological Society of Washington

Photographic Achievements

2003: Cover of Herpetological Review – 34(3)
 2002: Cover Reptiles magazine – 10(2)
 2001: The Nature Conservancy photo contest first place winner – May, 2001
 1999: Cover of the Vivarium magazine - 11(1)
 1999: Cover of Herpetological Review - 30(2)
 1999: Back cover of the American Entomologist - 45(1)
 1999: The Nature Conservancy photo contest first place winner - April, 1999
 1999: Cover of the Vivarium magazine - 10(3)
 1999: Photos used by the San Francisco Exploratorium museum's frog exhibit
 web-page
 1998: Cover of the Vivarium magazine - 9(5)
 1998: Image used for exhibition with the Smithsonian Institution Traveling
 Exhibition Service - *Vanishing Amphibians* - Spanish version for Latin
 America
 1997: All images in Declining Amphibian Populations Task Force pamphlet
 1996: Image used for exhibition with the Smithsonian Institution Traveling
 Exhibition Service - *Vanishing Amphibians* - North American tour
 1996: Cover of Reptiles magazine - April 1996
 1996: Cover of the Vivarium magazine - 7(4)
 1996: Cover of the International Hylid Society Newsletter 1(3)
 1995: Cover of the Vivarium magazine - 6(4)
 1994: Cover of the Vivarium magazine - 5(6)
 1994-1998: Minolta Inc. Equipment Sponsorship

Commercial Photographic Work

2001: Photographic work done for Coquico in Puerto Rico – promotional images
 2000: Images purchased by Wildlife Journal magazine Fall 2000
 1998: Image purchased by Argentine magazine "Gerencia Ambiental" 5(41):26
 1998: Image used for ecotourism advertisement - Greentracks Inc.
 1997: Images purchased by *Reptile and Amphibian Problem Solver* -
 Davies, 1997: Tetra Press
 1997: Images used in *The World's Most Spectacular Reptiles and Amphibians* -
 Lamar, 1997: World Publications
 1997: Image purchased by Discover magazine
 1997: Images purchased for commercial educational software - Leapfrog Inc.
 1994-present: Photographic advertisement images for Rep-Cal (reptile vitamins)

Lisa Rania Ganser

Laboratory

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University of Miami
Coral Gables, Florida 33124
(305) 328-4797
ganser@bio.miami.edu

Home

7975 SW 86th Street #202
Miami, Florida 33143
(305) 275-9395

Education

- 08/02-pres. University of Miami
Department of Biology
1301 Memorial Drive
Coral Gables, Florida 33124
PhD. Student
- 08/95-12/98 Northern Arizona University
Department of Biological Sciences
Flagstaff, Arizona 86011-5640
MS Biology 12/98
Thesis: Sex Differentiation and the Effects of Endocrine Disrupting
Chemicals in Two Anuran Species.
- 08/90-05/94 Saint Mary's College
Notre Dame, Indiana 46556
BS Biology
Senior Comprehensive: Light and Ultrastructural Analysis of the Seasonal
Differences in Spermathecae in the Marbled Salamander.
- 05/92-07/92 Butler University
Indianapolis, Indiana 46208
- 08/91-12/91 Marquette University
Milwaukee, Wisconsin 53233

Honors Received

- | | |
|------|---|
| 1996 | Nominated outstanding graduate teaching assistant |
| 1994 | Academic honors |
| 1994 | Mother Rose Elizabeth Award for excellence in biology |
| 1994 | Honors in senior comprehensive research |
| 1993 | Most improved. Varsity tennis |
| 1992 | Academic honors |
| 1991 | Academic honors |

Research and Professional Experience

- 09/03-pres. STAR/EPA Fellow
Drs. James C. O'Reilly and Zhongmin Lu, advisors
University of Miami
EPA-MAI STAR Fellowship
- 06/03-08/03 Research Assistant. Functional Morphology
Dr. James C. O'Reilly, advisor

University of Miami

01/03-06/03. Graduate Teaching Assistant. Neurobiology Laboratory.
Drs. John Lu and William Evoy, faculty advisors.
University of Miami

08/02-12/02 Graduate Teaching Assistant. General Physiology Laboratory.
Dr. Kathleen Sullivan Sealey, faculty advisor.
University of Miami

06/02-07/02 Instructor coSTEP Science Outreach Program for Home-Schooled
7-12th grade students. Dr. Nancy Nekvasil, supervisor.
Saint Mary's College.

08/01-06/02 Professional Specialist
Biology and Human Values laboratory, Comparative and Human
Anatomy laboratories. Dr. Thomas Platt, chair.
Saint Mary's College.

01/01-05-01 Visiting Instructor
Biology and Human Values laboratory, Comparative Physiology lab,
Human and Comparative and Human Anatomy labs.
Dr. Richard Jensen, chair.
Saint Mary's College

01/01-01/02 Research Histologist.
Cytology of the liver of *Nerodia fasciata* following a diet of As and Se
contaminated fish from a coal ash site.
Dr. William Hopkins, supervisor. Savannah River Ecology Lab.

Research Histologist.
Using skeletochronology of phalanges to determine age in the Marbled
Salamander, *Ambystoma opacum*.

08/00-12/00 Visiting Instructor.
Biology and Human Values course and laboratory.
Dr. Richard Jensen, chair
Saint Mary's College

06/00-12/00 Instructor coSTEP Science Outreach Program for middle school students.
Dr. Nancy Nekvasil, supervisor.
Saint Mary's College.

06/00-07/00 Summer Instructor Human Anatomy and Physiology.
Indiana University South Bend

08/99-06/00 Visiting Assistant Professor and Visiting Instructor.
Human and Comparative Physiology Courses and Labs and
Human Endocrinology. Anatomy Lab Instructor.
Dr. Nancy Nekvasil, supervisor.
Saint Mary's College

09/98-07/99 Histologist. Linda McGee, supervisor.
Mayo Foundation for Medical Education and Research.
Rochester, Minnesota.

06/97-08/98 Research Assistant. Dr. Catherine Propper, advisor.
Northern Arizona University.

01/97-05/97 Graduate Teaching Assistant. Human Anatomy and Physiology.
Dr. Paul Holmgren, advisor. Northern Arizona University.

08/95-12/96 Graduate Teaching Assistant. Animal Physiology.
Drs. Ronald Markle and Lon Owen, advisors.
Northern Arizona University

08/95-12/95 Independent Researcher.
Dr. Kurt Buhlmann, advisor.
Savannah River Ecology Lab/ George Washington National Forest

02/95-04/95 Microbiology Lab Assistant.
South Bend Medical Foundation.

01/95-06/95 Physiology Lab Technician.
Dr. Ken Olson, advisor.
Indiana Univ. Med School South Bend Center for Medical Education

08/94-12/94 General Biology Laboratory Instructor.
Dr. Doris Watt, advisor.
Saint Mary's College

06/94-08/94 Undergraduate Researcher.
Dr. John Krenz, advisor
Savannah River Ecology Lab.

08/94-05/94 Work Study Student. Immunology and General Biology.
Saint Mary's College.

08/94-05/94 Undergraduate teaching assistant. General Biology, Comparative
Anatomy, and Comparative Physiology.

06/93-08/93 Tennis Coach and Camp Counselor.
Saint Mary's College Summer Sports Camp

06/93-08/93 Biology Student Researcher.
Dr. David Sever, advisor.
Saint Mary's College.

09/92-12/93 Work Study Student. Biology and Chemistry.
Saint Mary's College.

01/92-08/92 Student Worker.
Saint Mary's College Dining Hall.

09/91-12/91 Biology and French Tutor.
Associated Students of Marquette University.

Internships

1991 Physical Therapy
Community Hospital, Indianapolis

1992 Pathology
Saint Vincent's Hospital, Indianapolis

Volunteer Projects

- 1993 Appalachia Program Saint Mary's College
 Nora, Virginia
- 1994 Flood Relief, University of Notre Dame
 Saint Louis, Missouri

Scholarships, Awards Received and/or Anticipated

Undergraduate

- 1990 Muskegon Community Foundation Scholarship
1991 Marquette University Scholarship

Graduate

- 1995-1998 Tuition Waivers, Northern Arizona University
2002-pres. Tuition Waiver, University of Miami

Federal Assistance, Grants, Awards Received and/or Anticipated

Undergraduate

- 1994 Research under Dr. David Sever's grant from the National Science Foundation
1995 Research under a grant from the George Washington National
 Forest.

Graduate

- 1997-98 Minority Biomedical Research Program. Northern Arizona
 University.
1996-98 Research grant from the National Council for Tobacco
 Research. Dr. Catherine Propper, advisor.
2003 EPA-MAI STAR fellowship.

Presentations Given

- 2003 Histological Study of the Hydrostatic Skeleton of the Caecilian, *Dermophis
 mexicanus*. **Rania Ganser, L.**
 Society for the Study of Amphibians and Reptiles,
 Manaus, Brazil.

- 2001 Histopathology of the Banded Water Snake, *Nerodia fasciata*, following chronic
 exposure to trace-element contaminated prey from a coal ash disposal site.
 Rania, L.C., W.A. Hopkins, L. O'Neil, S. Hasse, J.H. Roe, and D.M. Sever.
 Society for the Study of Amphibians and Reptiles.
 Indianapolis, Indiana.

- 2000 Comparative Biology of Sperm Storage in Amphibians.
 Sever, D.M., **L.C. Rania**, and R. Brizzi.
 Invited symposium speaker. International Congress of Zoology.
 Athens, Greece.

- 2000 Reproductive Biology of the Internal Fertilizing Frog *Ascaphus trueii*.
 Sever, D.M., E.C. Moriarty, L.C. Rania.

- 1998 A population of bullfrog tadpoles with a highly female-biased sex ratio.
 Society for the Study of Amphibians and Reptiles.
 Guelph, Canada.

- 1996 An unusual population of bullfrog tadpoles from Northern Arizona.
Declining Amphibian Populations Task Force Southwest Working Group.
Phoenix, Arizona.
- 1994 Non-lethal Age Determination of Marbled Salamanders.
Savannah River Ecology Lab Undergraduate Research Symposium.
- 1994 The annual cycle of sperm storage in the Marbled Salamander.
Butler University Undergraduate Research Conference.

Publications (most publications are listed in my maiden name, Lisa C. Rania)

- Sever, D. M., Rania, L. C., and R. Brizzi. 2003. Sperm storage in the class Amphibia. Pp. 414-421. In Legakis, A., Sfenthourakis, S., Polymeni, R., and M. Thessalou-Legaki (eds), *The New Panorama of Animal Evolution. Proc. 18th Int. Congr. Zoology*, Pensoft Publishers, Sofia-Moscow.
- Rania Ganser L., W.A. Hopkins, L. O'Neil, S. Hasse, J.H. Roe, and D.M. Sever. Histopathology of the liver of the southern water snake, *Nerodia fasciata*, following chronic exposure to trace element-contaminated prey from a coal ash disposal site. Accepted for publication in the *Journal of Herpetology* March 2002.
- Sever, D.M., E.C. Moriarty, L.C. Rania, L.V. Diller, and W.C. Hamlett. 2001. Reproductive biology of the internal fertilizing frog *Ascaphus truei* (Anura: Leiopelmatidae). *J. Morph.* 248: 1-21.
- Sever, D.M., L.C. Rania, and J.D. Krenz. 1996. Reproduction of the salamander, *Siren intermedia* Le Conte with especial reference to oviducal anatomy and mode of fertilization. *J. Morph.* 227: 335-348.
- Sever, D.M., L.C. Rania, and J.D. Krenz. 1996. The annual cycle of sperm storage in the spermathecae of the Red-Spotted Newt, *Notophthalmus viridescens* (Amphibia: Salamandridae). *J. Morph.* 227:1-16
- Sever, D.M., J.D. Krenz, K.M. Johnson, and L.C. Rania. 1994. Morphology and evolutionary implications of the annual cycle of secretion and sperm storage in spermathecae of the salamander *Ambystoma opacum* (Amphibia: Ambystomatidae). *J. Morph.* 222: 1-12.

References

- Dr. James C. O'Reilly. Assistant Professor. Department of Biology. University of Miami. 1301 Memorial Drive, Rm. 205. Coral Gables, FL 33124. (305) 284-4797.
oreilly@bio.miami.edu.
- Dr. Zhongmin (John) Lu. Assistant Professor. Department of Biology. University of Miami. 1301 Memorial Drive, Rm. 04. Coral Gables, FL 33124. (305) 284-6813.
zlu@bio.miami.edu.
- Dr. David M. Sever. Professor. Department of Biology. Saint Mary's College. Notre Dame, Indiana 46556. (574) 284-4665.
dsever@saintmarys.edu.
- Dr. Nancy P. Nekvasil. Professor. Department of Biology. Saint Mary's College. Notre Dame, Indiana 46556. (574) 284-4674.
- Dr. Richard Jensen. Professor. Department of Biology. Saint Mary's College. Notre Dame, Indiana 46556. (574) 284-4671.

RONALD C. ROZAR

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North Miami, FL 33181 USA

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Education Doctor of Philosophy in Biology

University of Miami, Miami, Florida USA
GPA 4.0/4.0
Expected Graduation Date: May 2007

Bachelor of Science in Zoology, August 1999

University of Florida, Gainesville, Florida USA
Minors in Anthropology and African Studies
GPA 3.0/4.0
Summer 1999: Studied Tropical Herpetology at the La Suerte Biological Research Station, Costa Rica
Fall 1997: Studied Biology at the University of Dar-es-Salaam, Tanzania

Associate of Science in Electro-Mechanical Engineering, May 1990

Owens Technical College, Toledo, Ohio USA
GPA 3.4/4.0

Experience Teaching Assistant

University of Miami August 2002 to present
Miami, Florida USA
Provided instruction to undergraduate students in Evolution and Biodiversity, as well as Introductory Biology. Ran laboratories in which students performed experiments in the aforementioned areas of concentration. Assisted students in improving their scientific writing abilities. Developed tests to evaluate student progress.

Biologists II

Johnson Controls June 2001 to July 2002
Fort Collins, Colorado USA
Participated in the United States Geological Survey's Brown Treesnake Project in Guam, Mariana Islands. Conducted demographic and maximum growth rate studies on venomous brown treesnakes. Determined relative abundance of snake and prey populations. Initiated bioelectrical impedance analysis study to quantify fat storage in free-ranging snakes and lizards. Participated in a pilot study of microhabitat use of brown treesnakes using radiotelemetry. Assisted US Fish and Wildlife Service personnel with the surgical implantation of radiotransmitters into snakes for distribution to various agencies for training purposes. Dissected snakes to examine stomach contents and reproductive condition. Maintained captive brown treesnake collection and mouse colony. Performed data entry and equipment maintenance.

Assistant Regional Nongame Biologist

Florida Fish and Wildlife Conservation Commission February 2001 to June 2001
Panama City, Florida USA
Provided technical assistance to Commission staff, various State and Federal agencies, ecological consultants, and the general public regarding nongame wildlife management, nuisance wildlife abatement, and habitat restoration or protection methodologies. Reviewed and processed nongame wildlife permit applications. Performed amphibian and bird population surveys. Operated boats, personal watercraft, and all-terrain vehicles. Responsible for database management, equipment maintenance, and various administrative and clerical duties.

Wildlife Technician

Florida Fish and Wildlife Conservation Commission March 2000 to January 2001
Fellsmere, Florida USA

Participated in year-round study of habitat selection and survivorship of the Florida mottled duck. Trapped ducks, assisted in the surgical implantation of radiotransmitters, and monitored location and life status of individuals using hand-held, truck-mounted, and aerial radiotelemetry equipment. Determined Robel density of vegetation surrounding nest sites. Operated amphibious vehicle. Maintained captive ducks. Additional duties included database management, equipment maintenance, and extensive public interaction.

Zookeeper

October 1999 to February 2000

Dallas Zoological Gardens

Dallas, Texas USA

Responsible for the captive husbandry of small to medium mammals and reptiles. Presented information on animal natural history and captive maintenance to the general public. Provided opportunities for direct public-animal interactions. Trained school children participating in the Junior Zookeeper Program in the art of animal husbandry.

Accomplishments

Performed a herpetological survey of the Cedar Keys National Wildlife Refuge (Florida, USA) and generated a historical herpetological profile of the Refuge from museum records with particular attention given to the movement of mainland species to the islands of the Refuge.

Examined the viability of polyvinyl chloride (PVC) pipe arrays as a sampling technique for tropical Hylid frogs in Costa Rica. A lack of differential between internal pipe humidity and ambient humidity in tropical wet forests, and an abundance of natural refugia were attributed to the lack of success observed with this technique (relative to success rates in temperate climates). This technique could be useful though if used in conjunction with other sampling techniques. PVC pipe use was positively correlated with daily precipitation.

Responsible for more than ten percent of the data entry for the Florida Museum of Natural History's herpetological database.

Have been issued a Venomous Reptile License by the Florida Fish and Wildlife Conservation Commission. This license requires 1000 hours of documented handling experience per snake family. I am licensed to maintain members of the families Viperidae, Crotalidae, Elapidae, and Colubridae.

Certified by the University of Miami's Animal Care and Use Committee to maintain and use animals for scientific research.

Affiliations The Society for the Study of Amphibians and Reptiles, member since 1990

The Northern Ohio Association of Herpetologists, member since 1990

The Herpetological Association of Africa, member since 1998

The Societas Europea Herpetologica, member since 2001

Gabriel E.A. Gartner

Education

1999-2002 **Cornell University**, Ithaca NY. Bachelors of Science with distinction in research and honors in the field of biology.

Fellowships and Honors

2002 Deans List, College of Agriculture and Life Sciences
2001 Howard Hughes Undergraduate Research Fellowship

Academic Activities and Positions Held

2001-2002 President, Cornell Herpetological Society
2001-2002 Treasurer, Cornell Herpetological Society
2000-2001 Vice President, Cornell Herpetological Society
1999-2000 Secretary, Cornell Herpetological Society

Teaching Experience

2002 Cornell University, BioEE 274 The Vertebrates: Form, Function and Evolution

Presentations

2002 Biological Sciences Honors Symposium: "Adaptation, Selective Regimes and the Comparative Method: A Case Study of the African Snake Genus *Dasypeltis*."
2001 Howard Hughes Undergraduate Research Symposium: "Chemical Mimicry in Vertebrates: A Case Study of the Common Waxbill, *Estrilda astrild*."

Publications

Gartner, G.E.A, and Greene, H.W. 2002 (In Prep). Adaptation in egg-eating snakes: A comparative approach to a classic study in evolutionary functional morphology.
(to be submitted to the Journal of Experimental Biology)

Gartner, G.E.A., and R. Reiserer 2002 (In Press). Notes on the reproductive biology of the speckled rattlesnake, *Crotalus mitchelli*. Herpetological Review.

Gartner, G.E.A. 2002. Undergraduate Honors Thesis. "Adaptation, Selective Regimes and the Comparative Method: A Case Study of the African Snake Genus *Dasypeltis*."

Memberships

Society for the Study of Amphibians and Reptiles

Work and Volunteer Experience

2002- *Santa Cruz Biotechnology: Research assistant in peptide analysis and evaluation, responsible for western blotting purified antibodies for product assessment and preparation of Cruz Blots™ for use in bio-medical research.*

1996-2002 Volunteer Lecturer, Santa Cruz City Schools, Santa Cruz, California: Lectured at local high schools on ecology and evolution of snakes.

1997 East Bay Vivarium, Berkeley California: Day to day maintenance of reptiles and amphibians, sales and customer relations. Assisted management in captive breeding various snakes, particularly pythons and boas.

VIII SUPPORTING DOCUMENTATION AND SPECIAL CONCERNS

A. Safety

This study will be conducted in easily accessible areas within Long Pine Key, and will not involve any dangerous activities.

B. Access to study sites

As stated above, this study will be conducted in easily accessible areas within Long Pine Key. Each study site will be accessed by car (100 m off of main roads) and/or by foot (off of the main hiking trail of Long Pine Key). Each site will be visited a minimum of one time per month for approximately 4 – 6 hours. None of the sites are located within restricted areas. During periods of high oak toad activity (wet season) some overnight camping may be necessary. Two to four people on this permit would be present at such times to assist in data collection.

C. Use of mechanized and other equipment

This oak toad study will be conducted using very basic equipment. 2m² throw traps will be built for use in data collection. These traps will be left in the field in between data collection events during our collection season (February through November). During this time, they will be kept out of view from any roads or foot-paths and “opened” so nothing could be inadvertently trapped. All materials and traps will be collected during the dry season (December through January) and at the end of the study (May 2006)

D. Chemical use

No hazardous materials or chemicals will be used in this study.

E. Ground disturbance

There will be no ground-disturbing activities such as soil pits, cores, stakes, or latrines. There will, however, be some disturbance of vegetation at the soil surface. Once a 2m² throw trap is employed, we propose that any and all vegetation within that 2 square meter plot be removed in order to: 1) quantify vegetation within the sample and 2) find and quantify all oak toads within the sample plot. Three of these samples will occur at each of the 18 study sites once per month.

F. Animal welfare

An IACUC protocol is pending the approval of this application permit.

G. NPS assistance

No NPS assistance (equipment or staff) will be needed to conduct our study. We would, ideally, have access to NPS hydrology data in order to assess the accuracy of our ground water level approximations.

H. Wilderness “minimum requirement” protocols

There are no locations for this study in areas administered by the NPS as “wilderness”.